

# Service Manual

ORDER NO.  
RRV1285

FILE-TYPE COMPACT DISC PLAYER

# PD-F1004

● Refer to the service manual RRV1225 for PD – F904/KU/CA.

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	PD – F1004		
KU/CA	○	AC120V	

## CONTENTS

1. CONTRAST OF MISCELLANEOUS PARTS .....	2
2. BLOCK DIAGRAM .....	6
3. SCHEMATIC AND PCB CONNECTION DIAGRAMS .....	7
4. IC INFORMATION .....	23
5. ADJUSTMENTS .....	30

# 1. CONTRAST OF MISCELLANEOUS PARTS

## NOTES :

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 $\Omega$   $\rightarrow$  56  $\times$  10<sup>1</sup>  $\rightarrow$  561 ..... RD1/8PM  $\begin{bmatrix} 5 & 6 & 1 \end{bmatrix}$  J

47k $\Omega$   $\rightarrow$  47  $\times$  10<sup>3</sup>  $\rightarrow$  473 ..... RD1/4PS  $\begin{bmatrix} 4 & 7 & 3 \end{bmatrix}$  J

0.5 $\Omega$   $\rightarrow$  0R5 ..... RN2H  $\begin{bmatrix} 0 & R & 5 \end{bmatrix}$  K

1 $\Omega$   $\rightarrow$  010 ..... RS1P  $\begin{bmatrix} 0 & 1 & 0 \end{bmatrix}$  K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k $\Omega$   $\rightarrow$  562  $\times$  10<sup>1</sup>  $\rightarrow$  5621 ..... RM1/4PC  $\begin{bmatrix} 5 & 6 & 2 & 1 \end{bmatrix}$  F

PD-F1004/KU/CA and PD-F904/KU/CA have the same construction except for the following :

Mark	Symbol & Description	Part No.		Remarks
		PD-F904/KU/CA	PD-F1004/KU/CA	
NSP	● Exterior			] *1, No. 6 (Page 10)
	28P F.F.C/30V	PDD1164	Not used	
	34P F.F.C/30V	Not used	PDD1159	
	Rear base (FE)	PNA2218	PNA2228	] Refer to Fig. 2
	MAIN BOARD assy	PWZ3077	PWZ3086	
	OUTPUT BOARD assy	PWZ3080	PWZ3089	
	I/O CONNECTOR BOARD assy	PWX1390	Not used	
	I/O BOARD assy	Not used	PWZ3092	
	VIDEO BOARD assy	Not used	PWZ3095	
	POWER BOARD assy	PWZ3065	PWZ2721	
	JOINT BOARD assy	PWZ3074	PWZ2732	
NSP	● Door Panel Assy			(*2: Sheet GRAY)
	Clear plate	PAM1681	PAM1637	
	Sheet G	PAM1680	PAM1690*2	
	Door stay	PNB1534	PNB1537	] *1, No. 29 (Page 14)
	Door panel	PNW2572	PNW2596	
	28P F.F.C/30V	PDD1160	Not used	
	34P F.F.C/30V	Not used	PDD1158	] Refer to Fig. 1
	Sheet	Not used	PNM1268	
	Lens A (PMMA)	Not used	PNW2467	
	Reflector	Not used	PRW1369	
	LED A BOARD assy	Not used	PWZ2733	
	LED B BOARD assy	Not used	PWZ2735	
	DISPLAY BOARD assy	PWZ3068	PWZ2724	
	SWITCH BOARD assy	PWZ3070	PWZ2726	
	ESCUTCHEON BOARD assy	PWZ3072	PWZ2730	
	● Packing			
	Operating instructions (English)	PRB1227	PRB1230	
	Wireless remote control unit	PWW1104	PWW1105	
	Packing case	PHG2133	PHG2142	
	Cord with plug (Video)	Not used	VDE1034	

Note \*1: Refer to "5. EXPLODED VIEWS, PACKING AND PARTS LIST" in the service manual RRV1225.

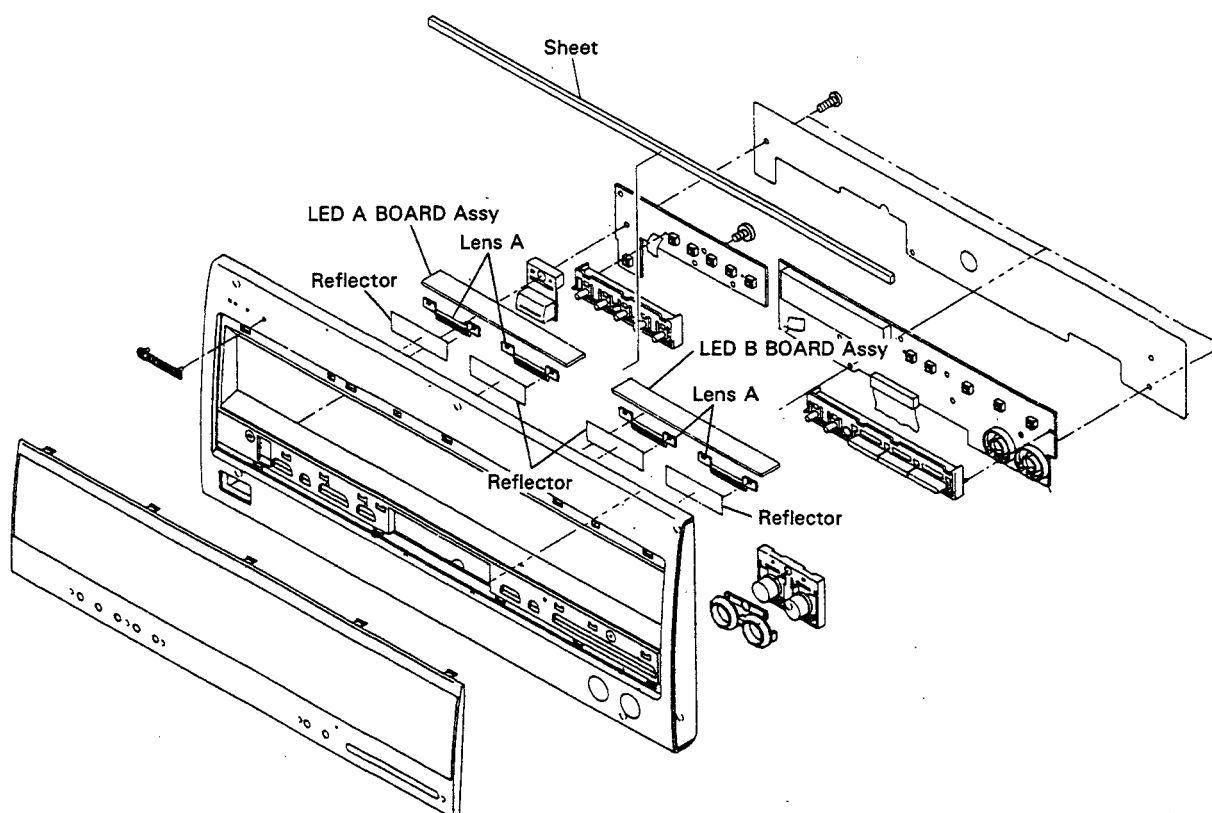


Fig. 1

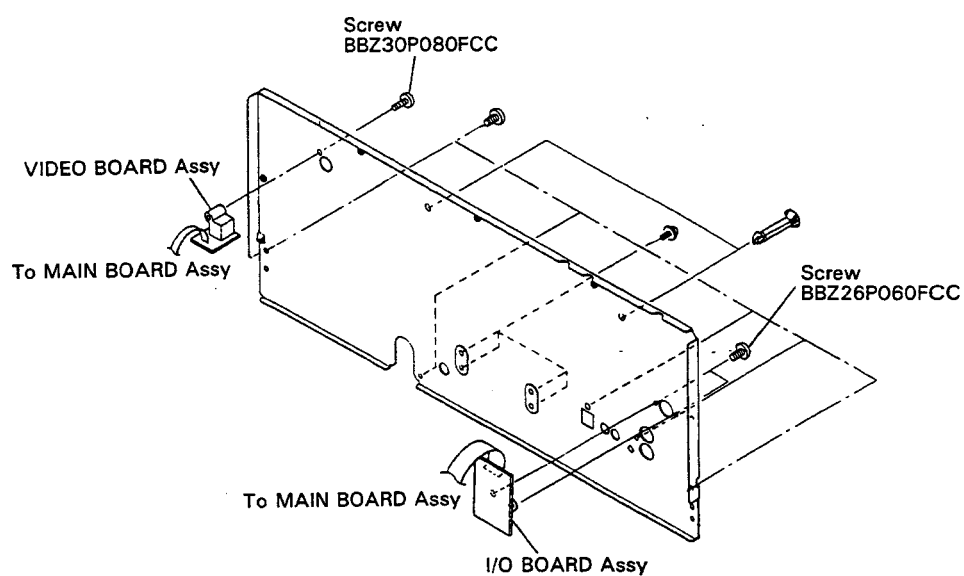


Fig. 2

PCB PARTS LIST

Mark	No.	Description	Parts No.
LIST OF ASSEMBLIES			
NSP	MOTHER BOARD ASSY		PWM1978
	└─ MAIN BOARD ASSY		PWZ3086
NSP	└─ OUTPUT BOARD ASSY		PWZ3089
	└─ I/O BOARD ASSY		PWZ3092
NSP	└─ VIDEO BOARD ASSY		PWZ3095
NSP	SUB BOARD ASSY		PWX1319
	└─ POWER BOARD ASSY		PWZ2721
	└─ DISPLAY BOARD ASSY		PWZ2724
NSP	└─ SWITCH BOARD ASSY		PWZ2726
NSP	└─ ESCUTCHEON BOARD ASSY		PWZ2730
NSP	└─ JOINT BOARD ASSY		PWZ2732
NSP	└─ LED A BOARD ASSY		PWZ2733
NSP	└─ LED B BOARD ASSY		PWZ2735

MAIN BOARD ASSY  
SEMICONDUCTORS

	IC151	CXA1372Q
	IC301	CXD2500BQ
△	IC202, IC203	LA6517
△	IC201	LA6520
	IC502	LH5168N-10L
	IC504	MM1031XS
	IC405	NJM4558M
	IC401	PD2026B (L)
	IC351	PD3316A
	IC501	PD4607A
	IC503	PD6162A
	Q501	2SC1740S
	Q391	2SC2412K
	Q403, Q404	2SD2114K
	Q322, Q405	DTC124EK
	D391-D397, D501	1SS254

COILS AND FILTERS

	L511	LAU220J
	L501	LFA100K
	L351	LFA820K

CAPACITORS

	C435-C438	CCSQCH050C50
	C513	CCSQCH080D50
	C354, C393	CCSQCH101J50
	C403	CCSQCH120J50
	C514	CCSQCH150J50
	C404	CCSQCH220J50
	C516	CCSQCH330J50
	C429, C430	CCSQCH390J50
	C515	CCSQCH470J50
	C152, C153	CEAS101M10
	C511, C512, C521	CEAS101M16
	C433, C434	CEAS220M25
	C208, C209, C301, C302, C401	CEAS330M16
	C431, C432, C71-C74	CEAS330M16
	C351, C501	CEAS331M6R3
	C523	CEAS471M6R3
	C160, C162	CEAS4R7M50
	C309	CEASR47M50
	C413, C415, C416, C421	CFTYA104J50
	C210	CKCYF103Z50

Mark	No.	Description	Parts No.
	C157, C164, C167, C169, C205		CKSQYB103K50
	C215, C218, C219, C225, C230		CKSQYB103K50
	C308		CKSQYB103K50
	C158, C159, C161, C163, C303		CKSQYB104K25
	C522		CKSQYB104K25
	C306		CKSQYB152K50
	C155		CKSQYB182K50
	C170		CKSQYB332K50
	C156, C168		CKSQYB333K25
	C171, C172		CKSQYB472K50
	C307		CKSQYB473K25
	C352, C353, C355, C361, C367		CKSQYF103Z50
	C461, C503-C505		CKSQYF103Z50
	C304, C305, C406, C410, C414		CKSQYF104Z25
	C423, C424, C75-C79		CKSQYF104Z25
	C502 (0.1μF/5.5V)		PCH1106
	VC511		PCM1003

RESISTORS

	VR151, VR152 (22kΩ)	RCP1084
	R394	RD1/6PM102J
	R213, R231-R233, R367, R511	RD1/6PM103J
	R522	RD1/6PM103J
	R226, R227, R439-R442	RD1/6PM104J
	R216	RD1/6PM123J
	R224, R228, R229	RD1/6PM134J
	R221, R222	RD1/6PM184J
	R395, R396	RD1/6PM223J
	R391, R393	RD1/6PM244J
	R205, R210, R215, R219, R225	RD1/6PM470J
	R230	RD1/6PM470J
	R445, R446	RD1/6PM471J
	R253, R504	RD1/6PM473J
	R523	RD1/6PM750J
	R521	RD1/6PM912J
	Other Resistors	RS1/10S□□□□

OTHERS

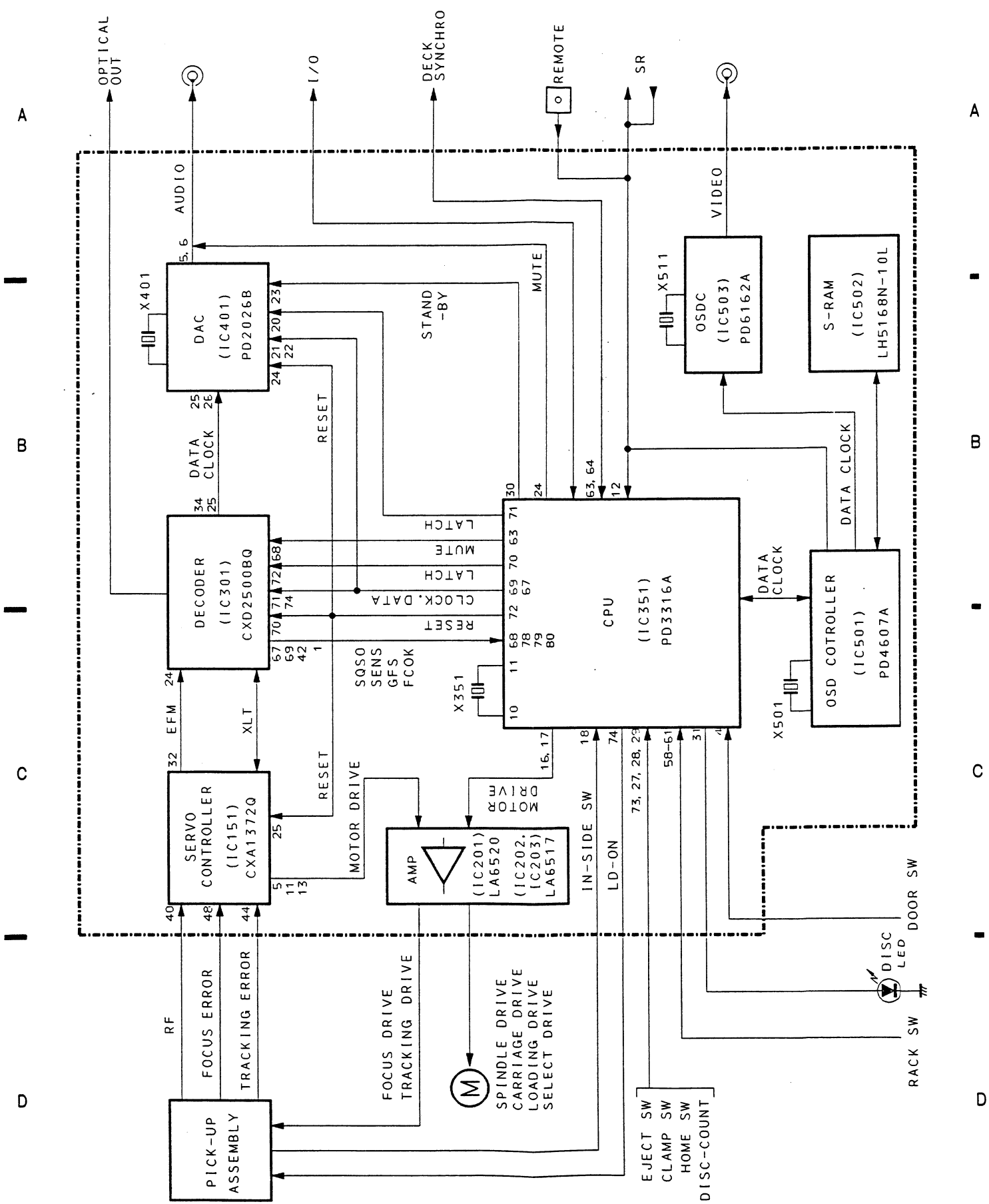
CN203	MT CONNECTOR 5P	173981-5
CN352	3P JUMPER CONNECTOR	52147-0310
CN11	12P JUMPER CONNECTOR	52147-1210
CN202	22P FFC CONNECTOR	9604S-22C
CN351	34P FFC CONNECTOR	9604S-34C
X511		ASS1056
CN501	3P SIDE POST	PKN1011
S301		PSG1006
X401	(16.9344MHz)	PSS1008
CN201	6P SIDE POST	VKN-004
X501	(4.19MHz)	VSS1028
X351		VSS1031

OUTPUT BOARD ASSY

COILS AND FILTERS		
	L391, L395, L396	LFA010K
CAPACITORS		
	C397, C399	CCCCH470J50
	C322	CEAS330M16
	C441, C442	CFTXA152J50
	C323	CKCYF103Z50
	C388, C389, C398	CKSQYB104K50
	C321	CKSQYF103Z50



## 2. BLOCK DIAGRAM



Mark	No.	Description	Parts No.
<b>OTHERS</b>			
	JA401	2P PIN JACK	PKB1009
	JA393	MINI JACK	PKN1005
	JA391, JA392	JACK	RKN1004
		(REMOTE CONTROL)	
	JA301	OPTICAL OUTPUT JACK	TOTX178
<b>I/O BOARD ASSY</b>			
<b>SEMICONDUCTORS</b>			
	D1301-D1314		1SS254
<b>CAPACITORS</b>			
	C1301-C1305	CKPUYB101K50	
	C1306-C1308	CKPUYF103Z25	
<b>RESISTORS</b>			
	All Resistors	RD1/6PM□□□□	
<b>OTHERS</b>			
	JA394	CONNECTOR	PKP-038
<b>VIDEO BOARD ASSY</b>			
<b>OTHERS</b>			
	JA501	1P PIN JACK	VKB1063
<b>POWER BOARD ASSY</b>			
<b>SEMICONDUCTORS</b>			
	△ IC22	NJM79M05FA	
	△ IC21	PQ05RR12	
	△ D11-D14, D52	11ES2	
	D54	MTZJ18B	
<b>CAPACITORS</b>			
	C52	CEAS101M35	
	C27, C28	CEAS471M6R3	
	C11, C13, C15-C17	CKCYF103Z50	
	C25, C26 (6800μF/16V)	VCH1123	
<b>RESISTORS</b>			
	All Resistors	RD1/6PM□□□□	
<b>OTHERS</b>			
	△	POWER TRANSFORMER/10W	PTT1297
		TERMINAL	RKC-061
<b>DISPLAY BOARD ASSY</b>			
<b>SEMICONDUCTORS</b>			
	Q702-Q705	2SA933S	
	D703, D704	1SS254	
<b>SWITCHES AND RELAYS</b>			
	S703, S707, S708, S711, S712	PSG1006	
	S715, S716	PSG1006	
<b>RESISTORS</b>			
	All Resistors	RD1/6PM□□□□	
<b>OTHERS</b>			
	CN701	34P FFC CONNECTOR	9604S-34F
	V701	FL TUBE	PEL1079

Mark	No.	Description	Parts No.
<b>SWITCH BOARD ASSY</b>			
<b>SEMICONDUCTORS</b>			
	D701, D702	1SS254	
<b>SWITCHES AND RELAYS</b>			
	S701, S702, S709, S710	PSG1006	
	S713, S714	PSG1006	
<b>OTHERS</b>			
		REMOTE SENSOR	SBX1785-51
<b>ESCUTCHEON BOARD ASSY</b>			
<b>OTHERS</b>			
	CN801	3P JUMPER CONNECTOR	52151-0310
	J802	CONNECTOR ASSY (2P)	PDE1250
<b>JOINT BOARD ASSY</b>			
<b>OTHERS</b>			
	CN751, CN752	34P FFC CONNECTOR	9604S-34F
<b>LED A BOARD ASSY</b>			
<b>SEMICONDUCTORS</b>			
	D731-D736	SEL2915A	
<b>RESISTORS</b>			
	All Resistors	RD1/6PM□□□□	
<b>LED B BOARD ASSY</b>			
<b>SEMICONDUCTORS</b>			
	D737-D742	SEL2915A	
<b>RESISTORS</b>			
	All Resistors	RD1/6PM□□□□	

### 3. SCHEMATIC AND PCB CONNECTION DIAGRAMS

#### 3.1 MECHA BOARD ASSY, SENSOR BOARD ASSY, LOADING BOARD ASSY, SELECT MOTOR BOARD ASSY, LOADING MOTOR BOARD ASSY AND MECHANISM BOARD ASSY

##### A NOTE FOR SCHEMATIC DIAGRAMS

(Type 4A)

1. When ordering service parts, be sure to refer to "PARTS LIST OF EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:  
Unit: k: k $\Omega$ , M: M $\Omega$ , or  $\Omega$  unless otherwise noted.  
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.  
Tolerance: (F):  $\pm 1\%$ , (G):  $\pm 2\%$ , (K):  $\pm 10\%$ , (M):  $\pm 20\%$  or  $\pm 5\%$  unless otherwise noted.

4. CAPACITORS:  
Unit: p: pF or  $\mu$ F unless otherwise noted.  
Ratings: capacitor ( $\mu$ F)/ voltage (V) unless otherwise noted.  
Rated voltage: 50V except for electrolytic capacitors.

5. COILS:  
Unit: m: mH or  $\mu$ H unless otherwise noted.

##### 6. VOLTAGE AND CURRENT:

or - V :  
DC voltage (V) in PLAY mode unless otherwise noted.  
or - mA :  
DC current in PLAY mode unless otherwise noted.  
Value in ( ) is DC current in STOP mode.

##### 7. OTHERS:

- ⊙ or ⦿ : Adjusting point.
- ⦿ : Measurement point.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

##### 8. SCH-□ ON THE SCHEMATIC DIAGRAM:

- SCH-□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

##### 9. SWITCHES (Underline indicates switch position):

MECHANISM BOARD ASSY  
S610 INSIDE SW

MAIN BOARD ASSY  
S301 TEST MODE

DISPLAY BOARD ASSY  
S703  $\lll$   
S707 PAUSE  $\lll$   
S708 DISC NUMBER -  
S711  $\ggg$   
S712 STOP  $\blacksquare$   
S715 PLAY  $\ggg$   
S716 DISC NUMBER +

SWITCH BOARD ASSY  
S701 RANDOM  
S702 POWER STANDBY/ON  
S709 MODE  
S710 CLEAR  
S713 ADLC  
S714 TIME

SENSOR BOARD ASSY  
S631 HOME

RACK BOARD A ASSY  
S651 EJECT  
S652 EJECT

RACK BOARD B ASSY  
S653 EJECT  
S654 EJECT

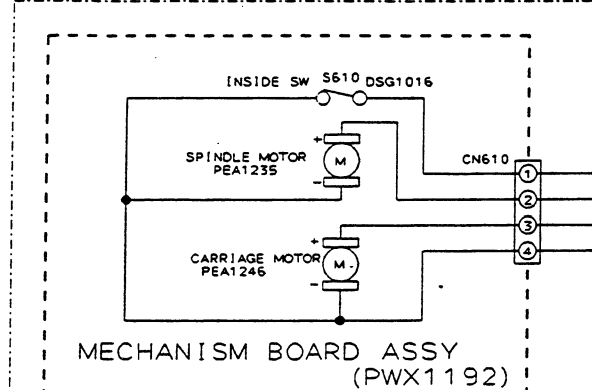
LOADING MECHANISM ASSY (PXA1571)

LOADING MECHANISM BOARD ASSY (PWX1339)

SELECT MOTOR BOARD ASSY (PWZ2782)

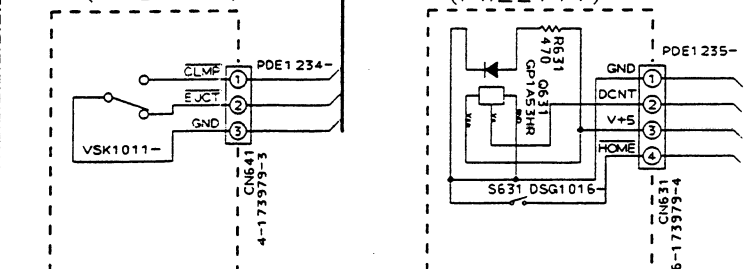
LOADING MOTOR BOARD ASSY (PWZ2783)

SERVO MECHANISM ASSY B (PXA1539)

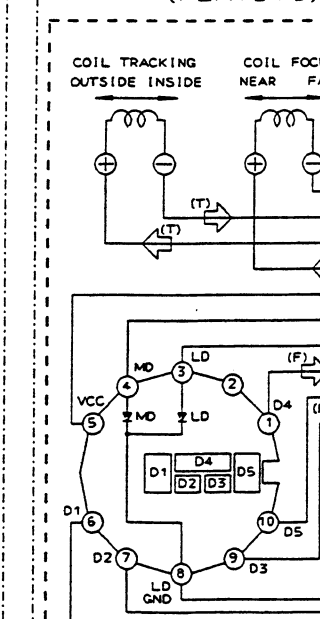


LOADING BOARD ASSY (PWZ2778)

SENSOR BOARD ASSY (PWZ2777)

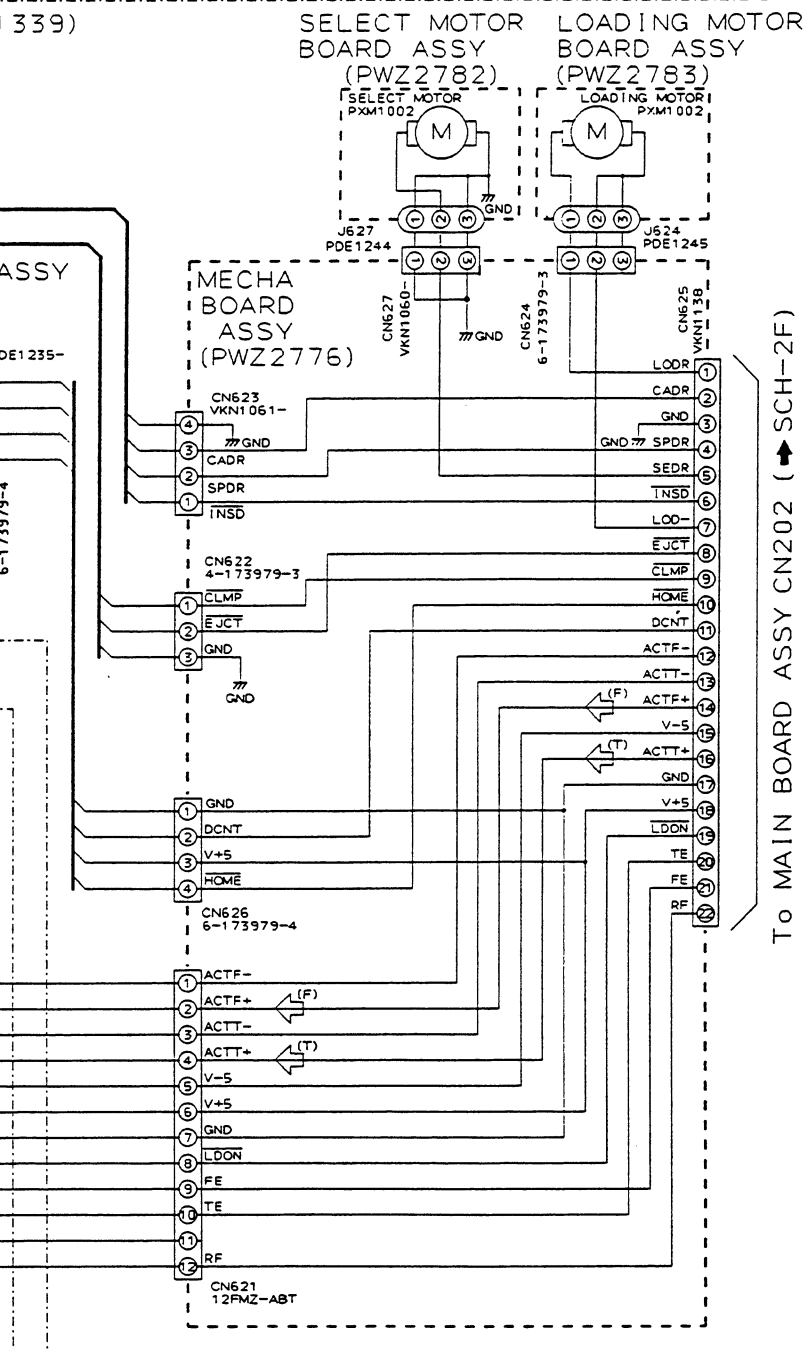
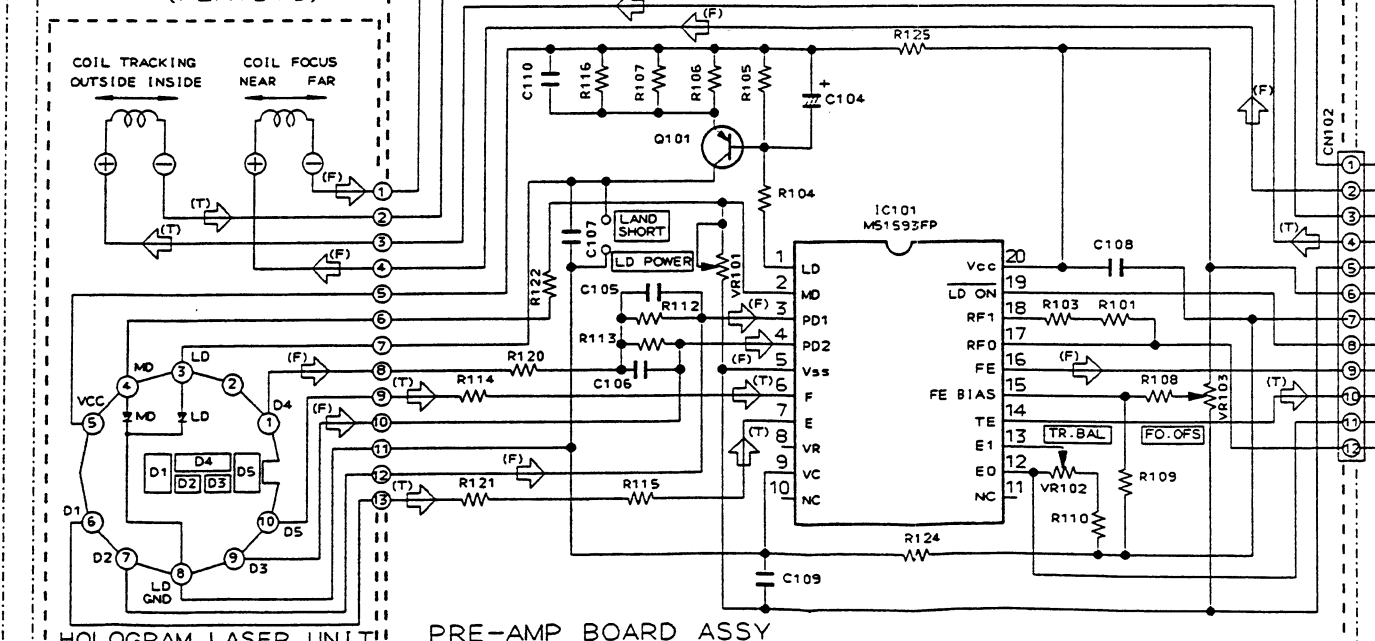


PICKUP ASSY (PEA1319)



HOLOGRAM LASER UNIT

PRE-AMP BOARD ASSY



To MAIN BOARD ASSY CN202 (SCH-2F)

SIGNAL ROUTE

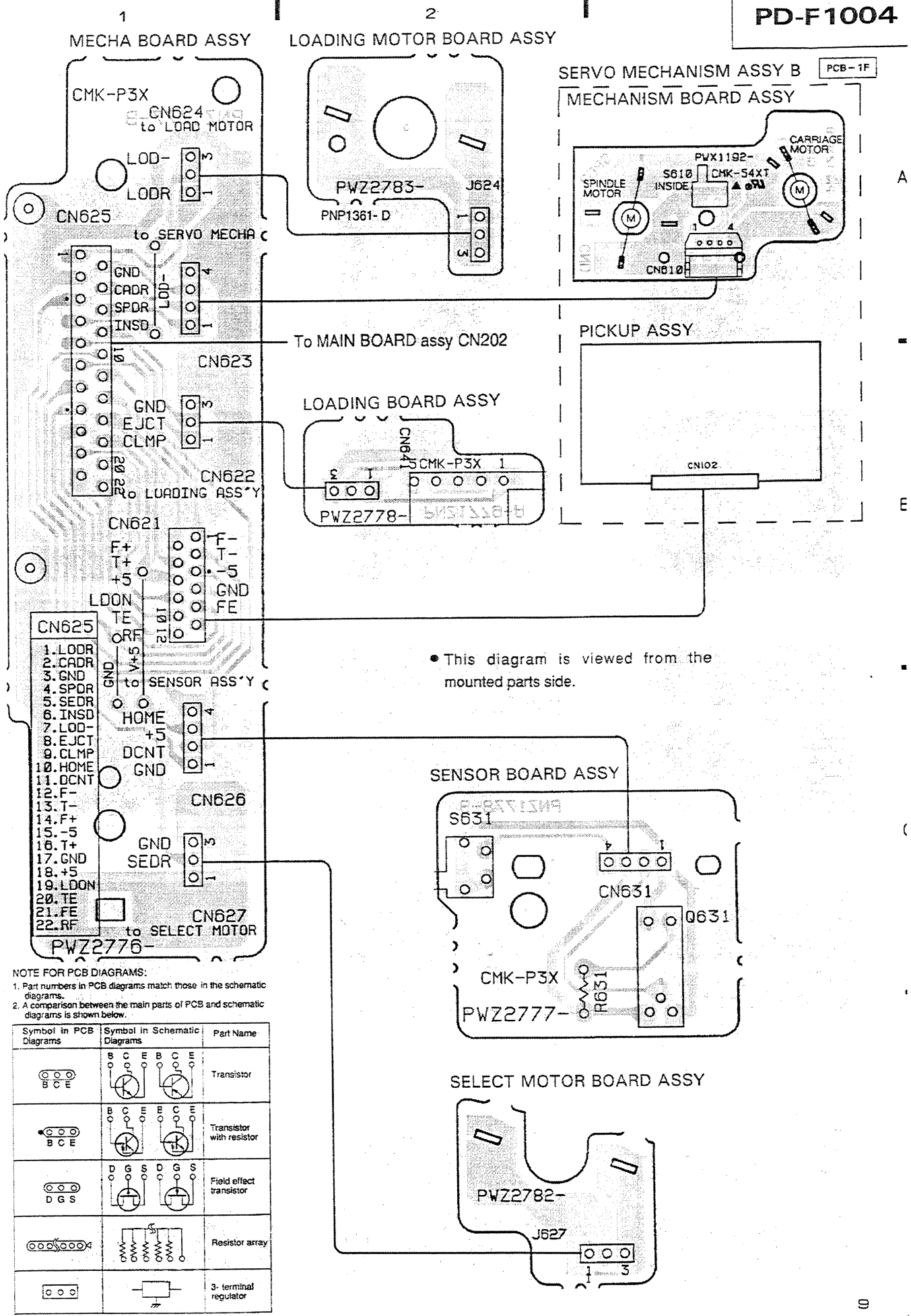
 $\leftarrow$  (F) : FOCUS SERVO LOOP LINE $\leftarrow$  (T) : TRACKING SERVO LOOP LINE

SCH-1F

MECHA BOARD ASSY, SENSOR BOARD ASSY,  
LOADING BOARD ASSY, SELECT MOTOR BOARD  
ASSY, LOADING MOTOR BOARD ASSY,  
MECHANISM BOARD ASSY

MECHA BOARD ASSY, SENSOR BOARD ASSY,  
LOADING BOARD ASSY, SELECT MOTOR BOARD  
ASSY, LOADING MOTOR BOARD ASSY,  
MECHANISM BOARD ASSY

SCH-1F



NOTE FOR PCB DIAGRAMS:  
1. Part numbers in PCB diagrams match those in the schematic diagrams.  
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

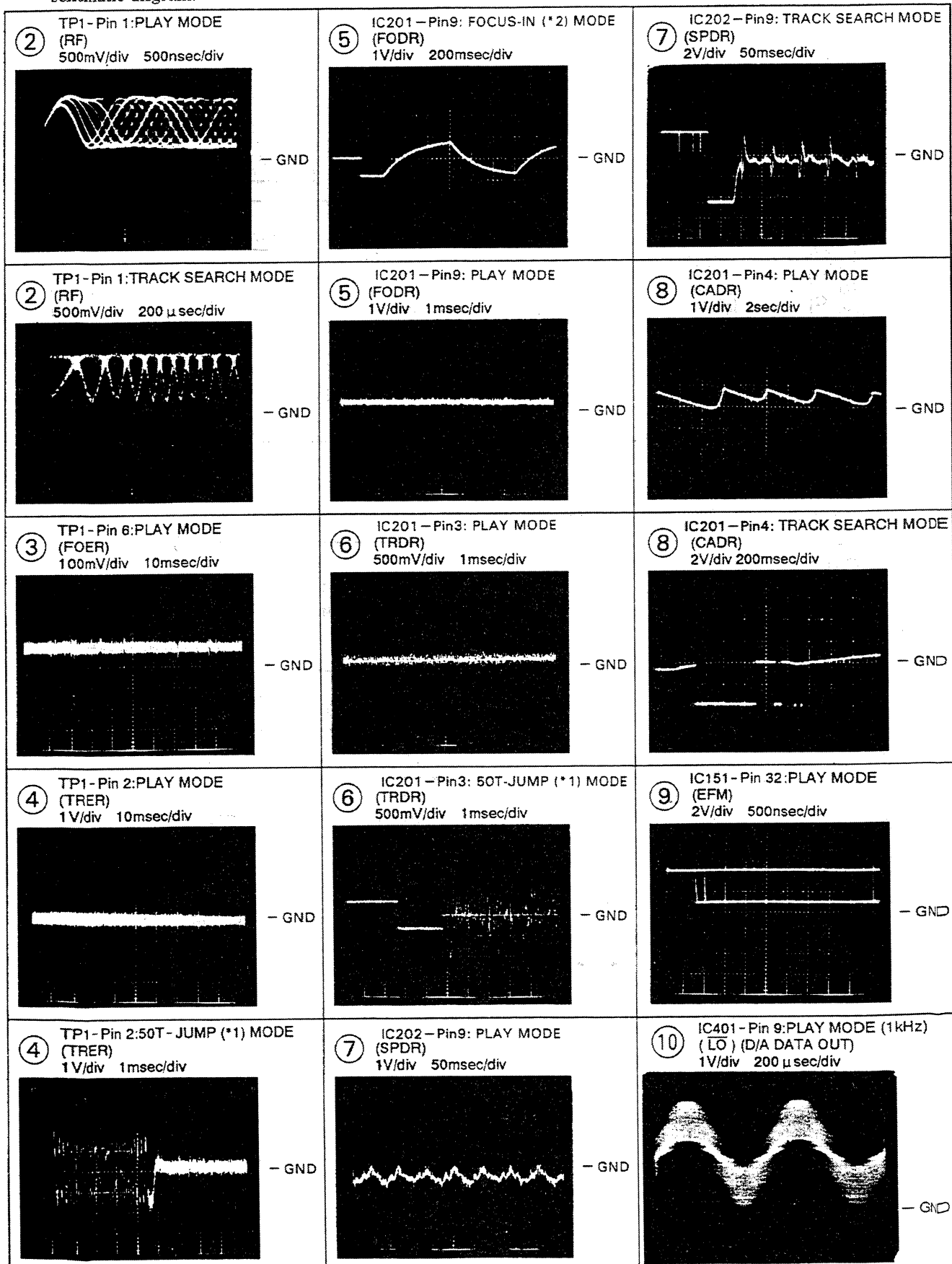
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

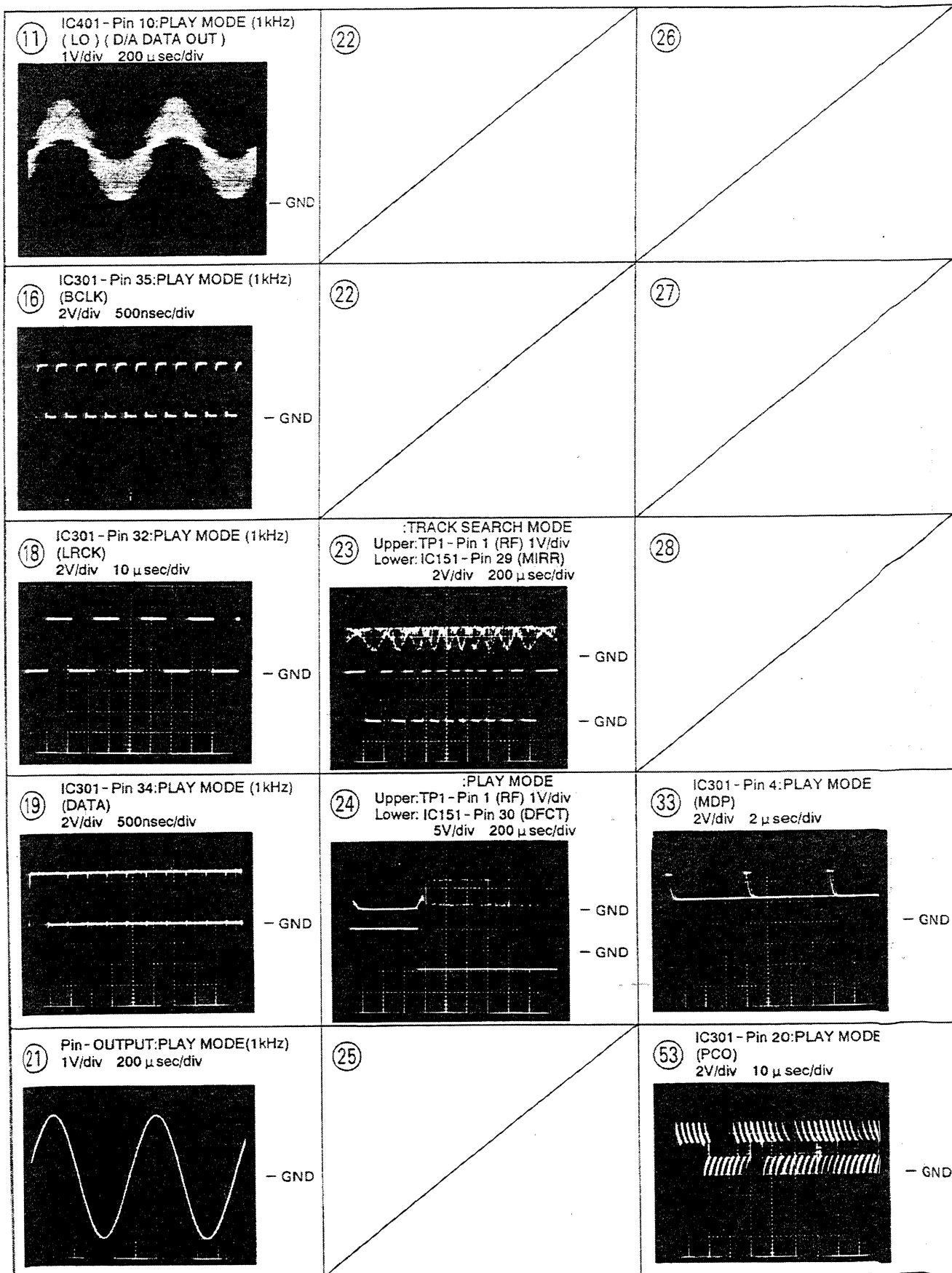
# Waveforms of MAIN BOARD Assy

Note: The encircled numbers denote measuring point in the schematic diagram.

\*1 50T-JUMP: After switching to the pause mode, press the manual search key.

\*2 FOCUS-IN: Press the key without loading a disc.





# Voltages of MAIN BOARD Assy

IC501 (PD4607A)

Pin No.	Voltage[V]
1 to 8	5
9	4.4
10	0.5
11	0.1
12	3.2
13, 14	5
15	0
16, 17	5
18 to 23	0
24	4.8
25	0
26	4.8
27	0
28	4.8
29	5
30	0
31	0
32	5
33	0
34, 35	2.3
36 to 38	0
39	4.8
40 to 43	0
44, 45	4.9
46	0
47	5
48 to 51	0
52 to 70	5
71	0
72 to 80	5

IC502 (LH5168N-10L)

Pin No.	Voltage[V]
1 to 5	0
6	4.8
7	0
8	4.8
9	0
10	4.8
11 to 15	0
16	4.8
17 to 19	0
20	4.5
21	0
22	4.9
23 to 25	0
26	4.5
27	4.9
28	4.5

IC201 (LA6520)

Pin No.	Voltage[V]
1 to 10	0
11	0.1
12	7.8

IC202, IC203 (LA6517)

Pin No.	Voltage[V]
1	0
2	7.8
3	0
4	-7.8
5 to 8	0

IC503 (PD6162A)

Pin No.	Voltage[V]
1 to 4	5
5	0
6	4.5
7	5
8	2.4
9	2.3
10	4.5
11	5
12, 13	4.9
14	0
15	2
16	1.8
17	3.7
18, 19	0.1
20	0.3
21	5
22	4.4
23	0.5
24	3.2
25 to 27	1.6
28	0

IC504 (MM1031XS)

Pin No.	Voltage[V]
1	1.6
2, 3	0
4	2.1
5	5

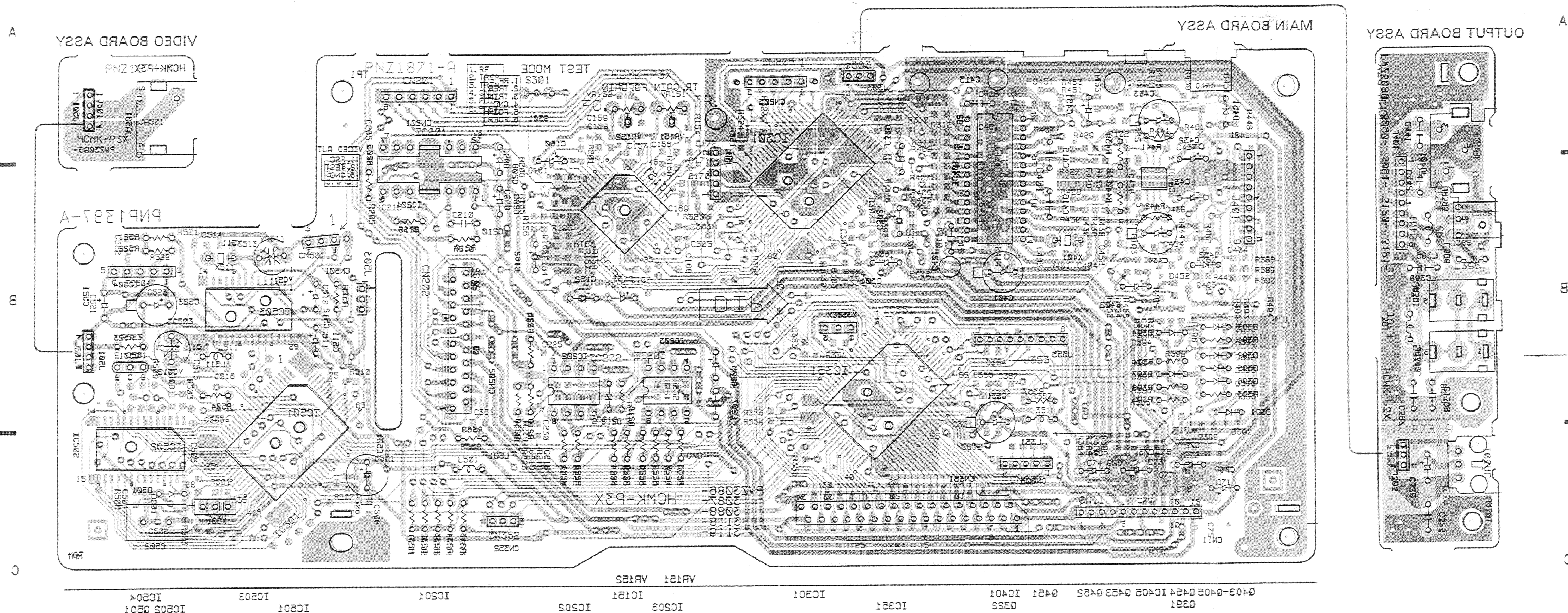
IC351 (PD3316A)

Pin No.	Voltage[V]
1 to 7	0
8	5
9	0
10, 11	2.3
12, 13	5
14 to 18	0
19	5
20 to 23	0
24, 25	5
26	0.3
27	5
28	0
29	5
30, 31	0
32 to 51	-26.7
52 to 55	4.8
56	0
57 to 61	5
62	0
63 to 65	5
66	0
67 to 70	5
71	0
72 to 77	5
78	0
79, 80	5

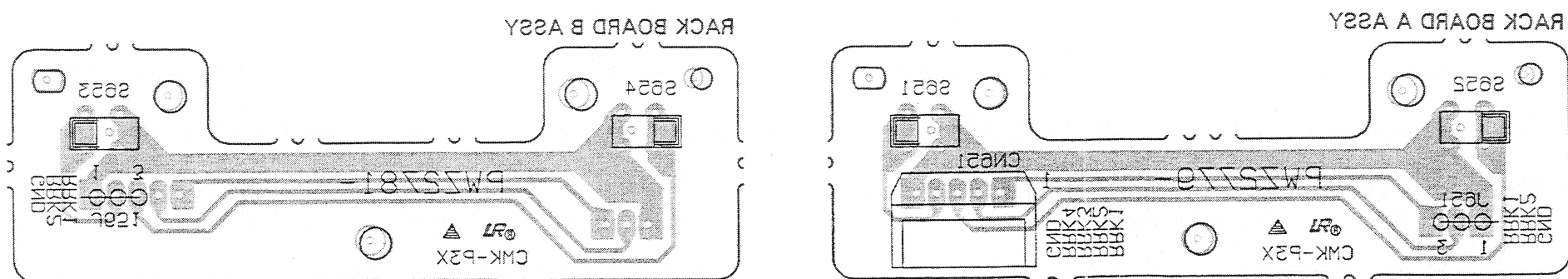
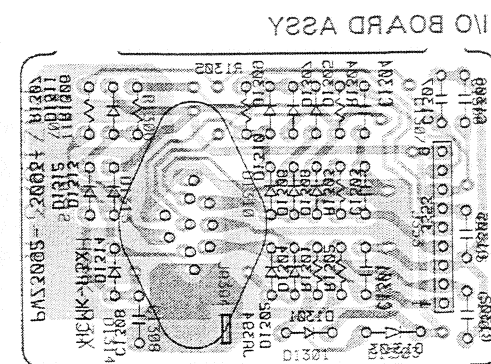
Q501

	Voltage[V]
E	4.5
C	5
B	5



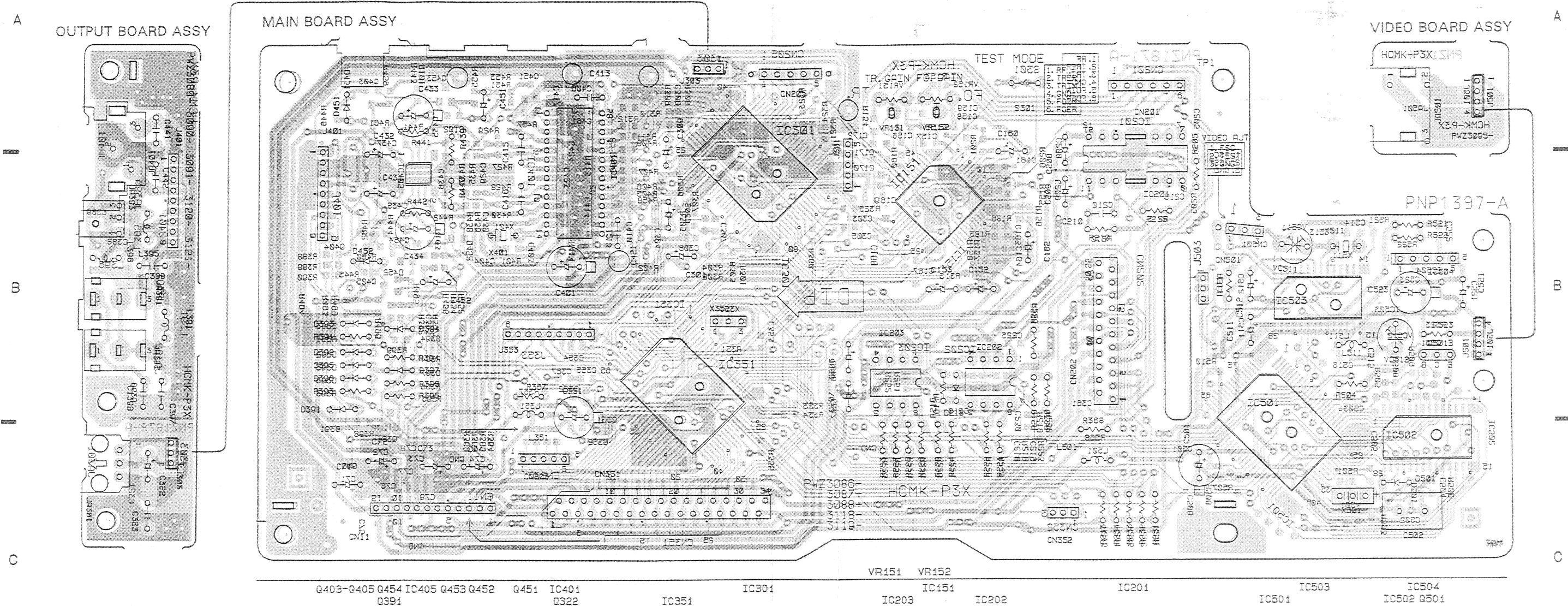


- This diagram is viewed from the gray colored foil side.
- This PCB is double sided.



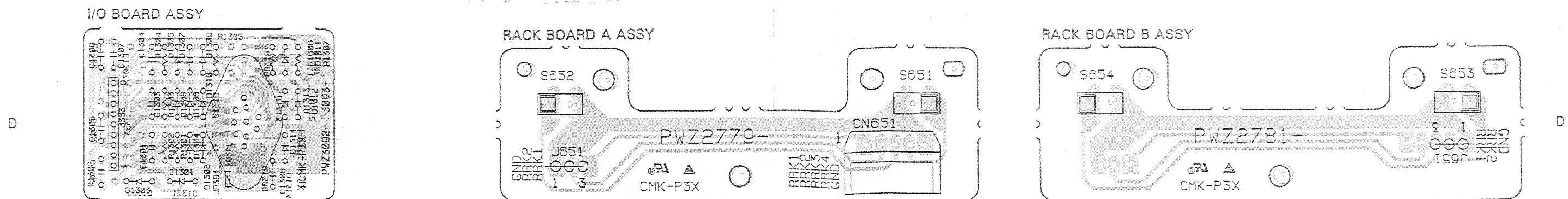
### 3.2 MAIN BOARD ASSY, OUTPUT BOARD ASSY, RACK BOARD A ASSY, RACK BOARD B ASSY, VIDEO BOARD ASSY AND I/O BOARD ASSY

The parts mounted on this PCB include all necessary parts for several destinations.  
For further information for respective destinations, be sure to check with the schematic diagram.




- This diagram is viewed from the pink colored foil side.
- This PCB is double sided.

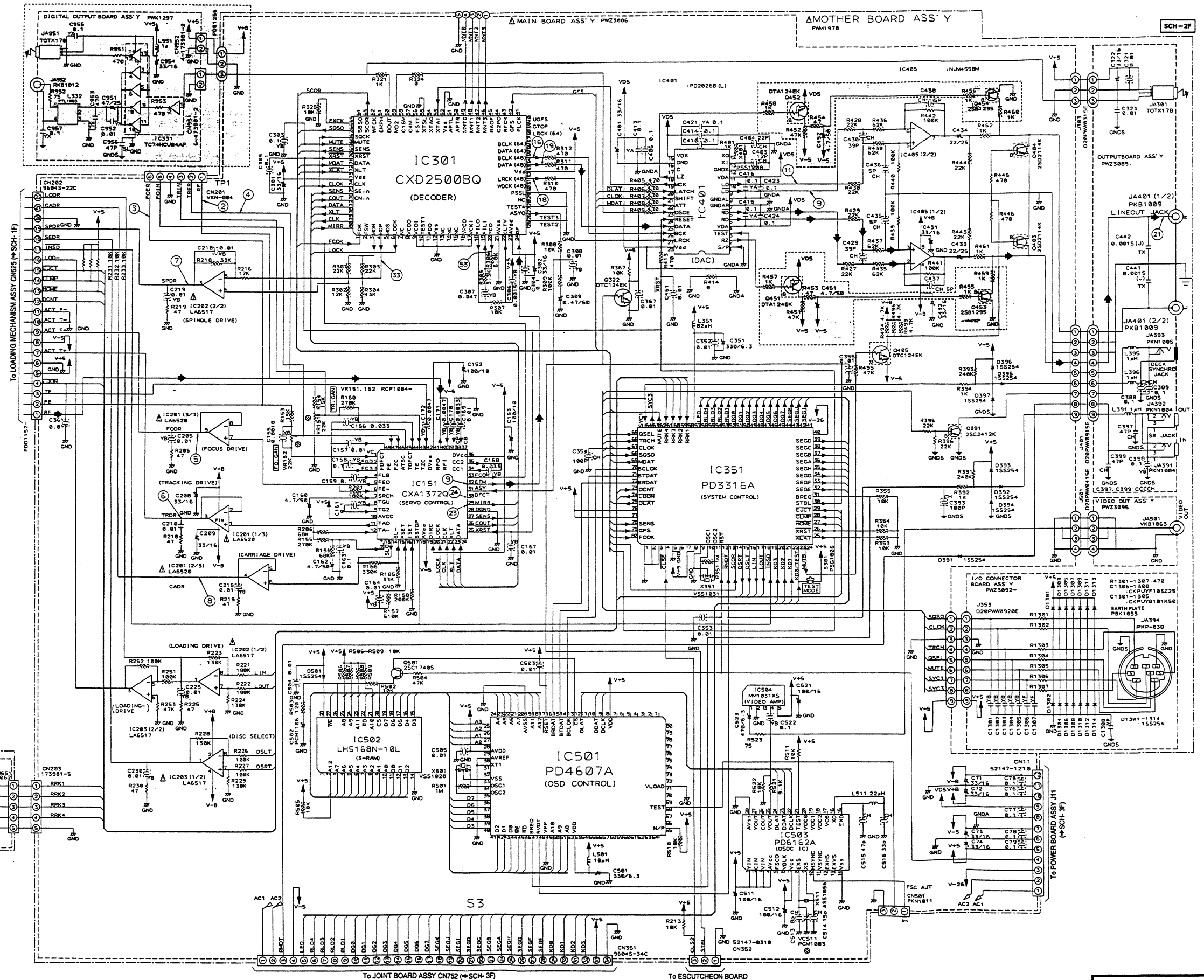
- This diagram is viewed from the mounted parts side.





NOTE: Section marked with  are not used for PD-F1004/KU/CA.

Voltage(V)			
	Emitter	Collector	Base
Q322	0	5	0
Q391	0	2.6	0.7
Q403	0	0	-5
Q404	0	0	-5
Q405	-5	-5	0
Q451	0	5	0
Q452	5	5	0
Q453	0	0	5
Q454	0	0	5
Q701	0	0	-0.3
Q702	0	-4.4	2.1
Q703	0	0	-0.3
Q704	0	0	-0.3
Q705	0	0	-0.3



SCH-2F

MAIN BOARD ASSY, OUTPUT BOARD ASSY,  
RACK BOARD A ASSY, RACK BOARD B ASSY,  
VIDEO BOARD ASSY, I/O BOARD ASSY

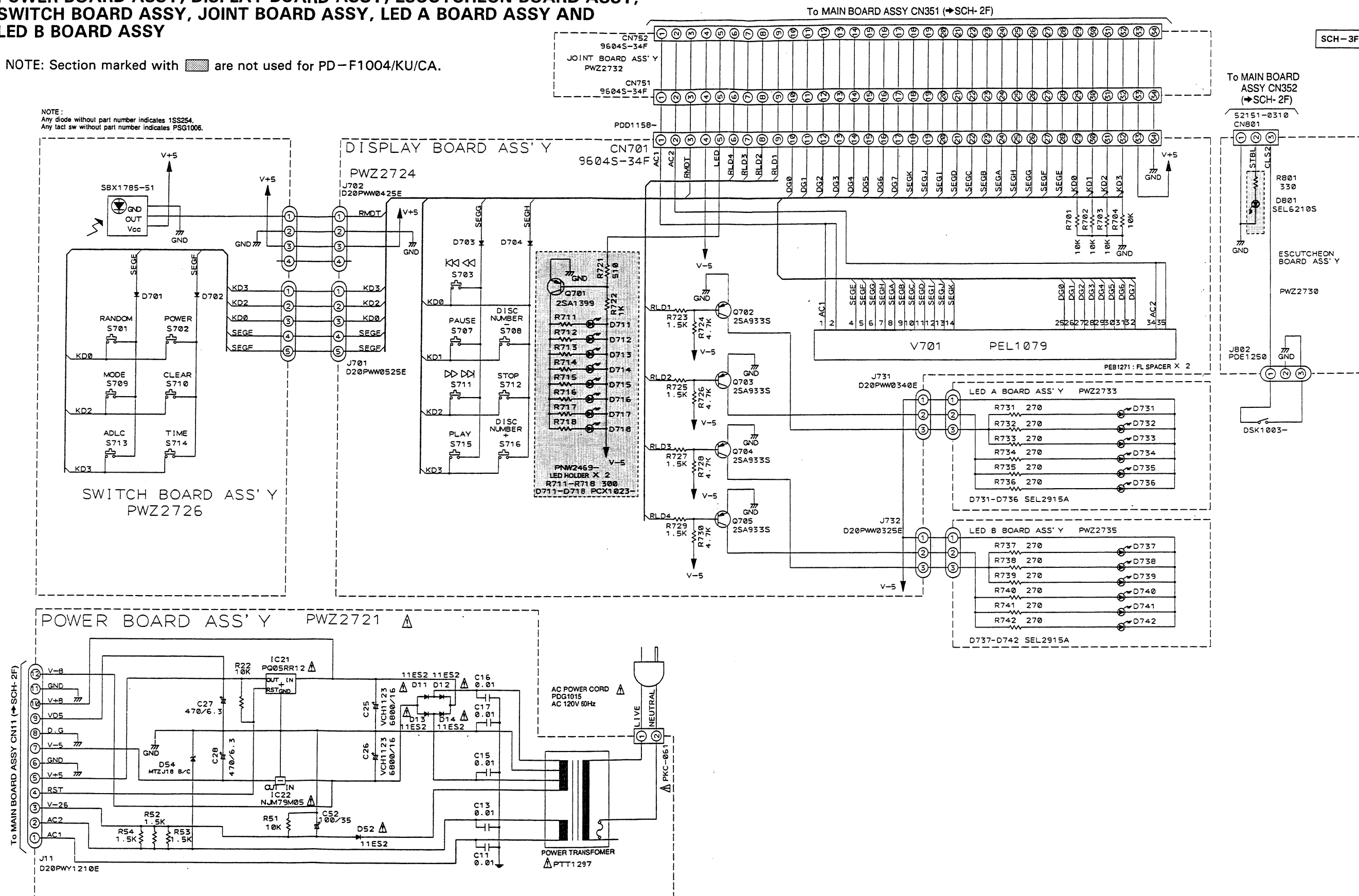
MAIN BOARD ASSY, OUTPUT BOARD ASSY,  
RACK BOARD A ASSY, RACK BOARD B ASSY,  
VIDEO BOARD ASSY, I/O BOARD ASSY

SCH-2F

### 3.3 POWER BOARD ASSY, DISPLAY BOARD ASSY, ESCUTCHEON BOARD ASSY, SWITCH BOARD ASSY, JOINT BOARD ASSY, LED A BOARD ASSY AND LED B BOARD ASSY

NOTE: Section marked with  are not used for PD-F1004/KU/CA.

NOTE:  
Any diode without part number indicates 1SS254.  
Any tact sw without part number indicates PSG1006.

**SCH-3F**

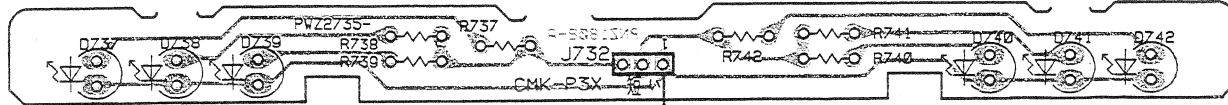
POWER BOARD ASSY, DISPLAY BOARD ASSY,  
SWITCH BOARD ASSY, ESCUTCHEON BOARD ASSY,  
JOINT BOARD ASSY, LED A BOARD ASSY,  
LED B BOARD ASSY

POWER BOARD ASSY, DISPLAY BOARD ASSY,  
SWITCH BOARD ASSY, ESCUTCHEON BOARD ASSY,  
JOINT BOARD ASSY, LED A BOARD ASSY,  
LED B BOARD ASSY

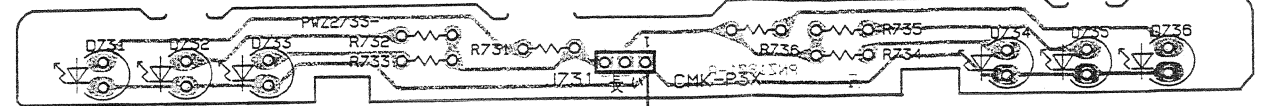
**SCH-3F**

PCB-3F

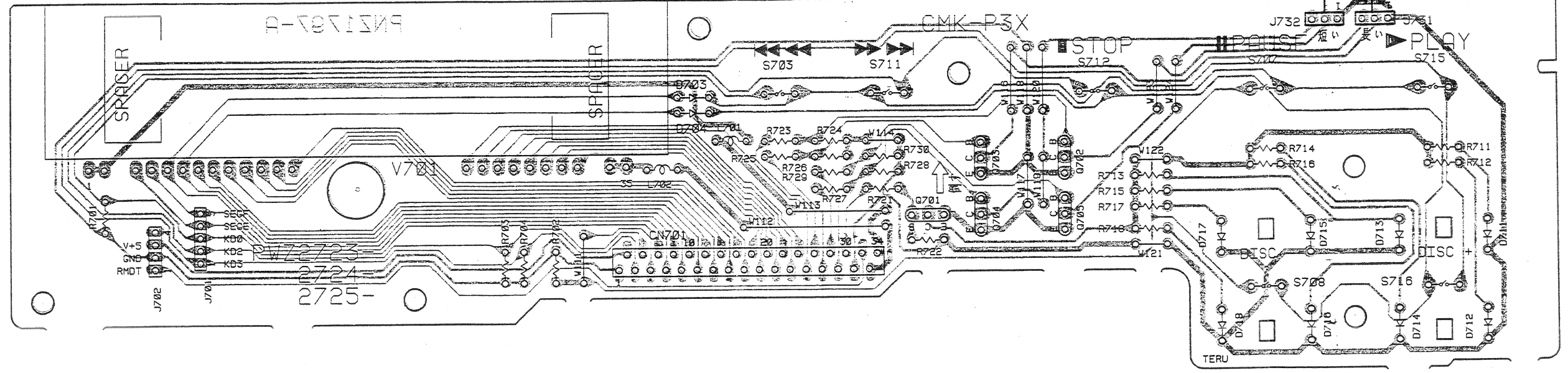
LED B BOARD ASSY



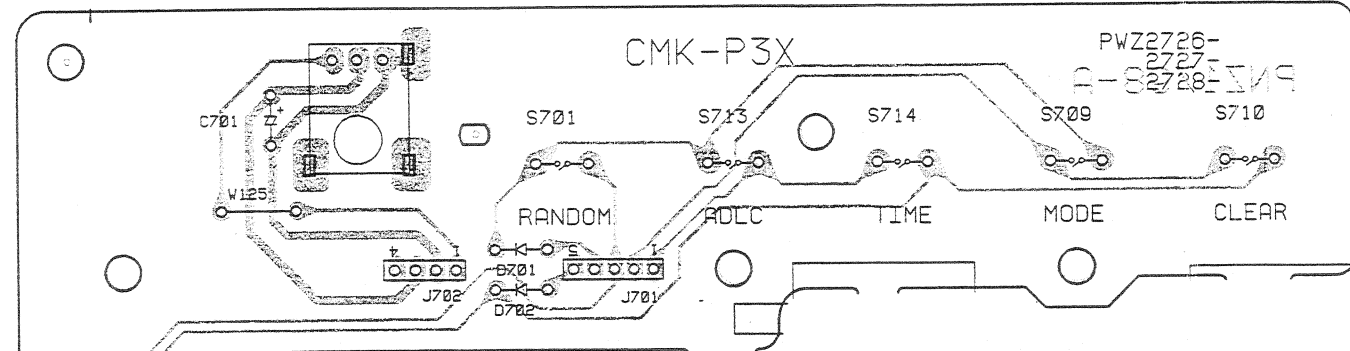
LED A BOARD ASSY



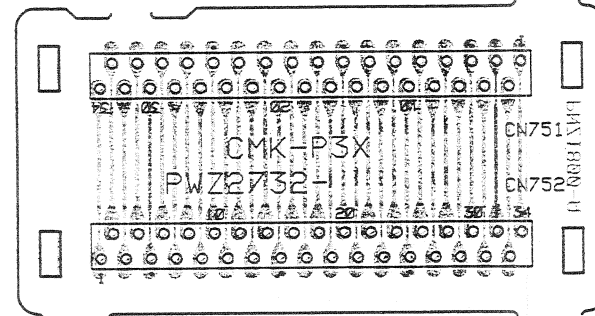
DISPLAY BOARD ASSY



SWITCH BOARD ASSY



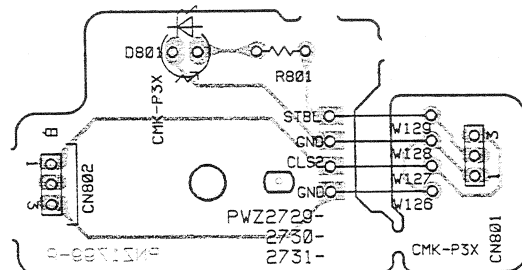
JOINT BOARD ASSY



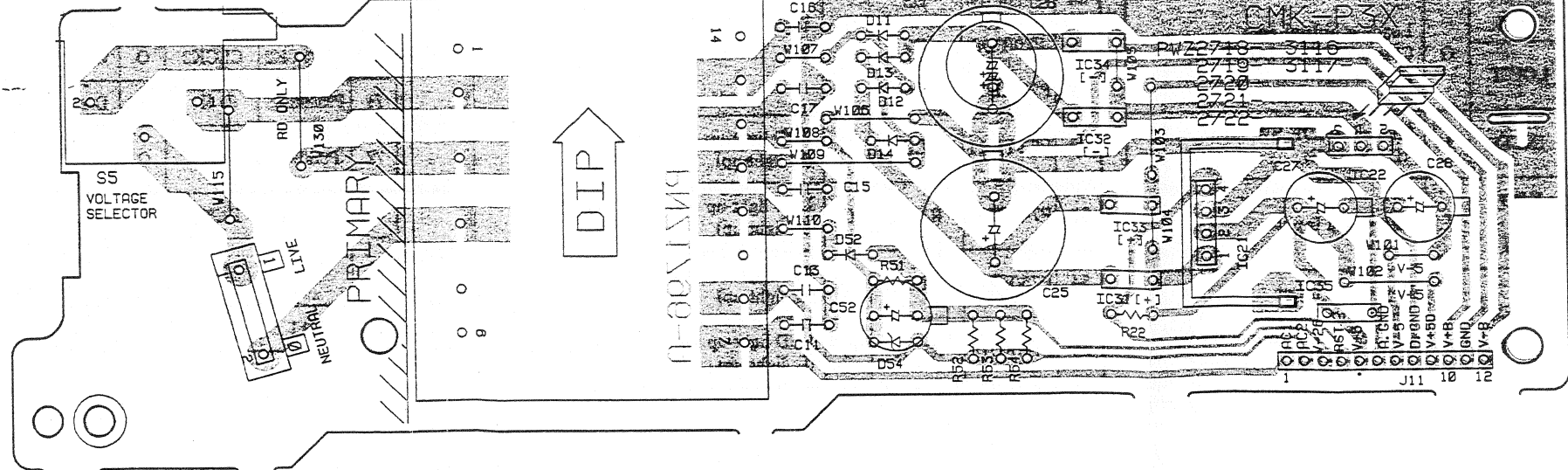
• This diagram is viewed from the mounted parts side.

The parts mounted on this PCB include all necessary parts for several destinations.  
For further information for respective destinations, be sure to check with the schematic diagram.

ESCUTCHEON BOARD ASSY



POWER BOARD ASSY



4. IC INFORMATION

● The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ PD3316A (IC351 : MAIN BOARD ASSY)

- System Control IC, CMOS IC  
SR Input, System Control, Display Data Serial Transmission
- Pin Function

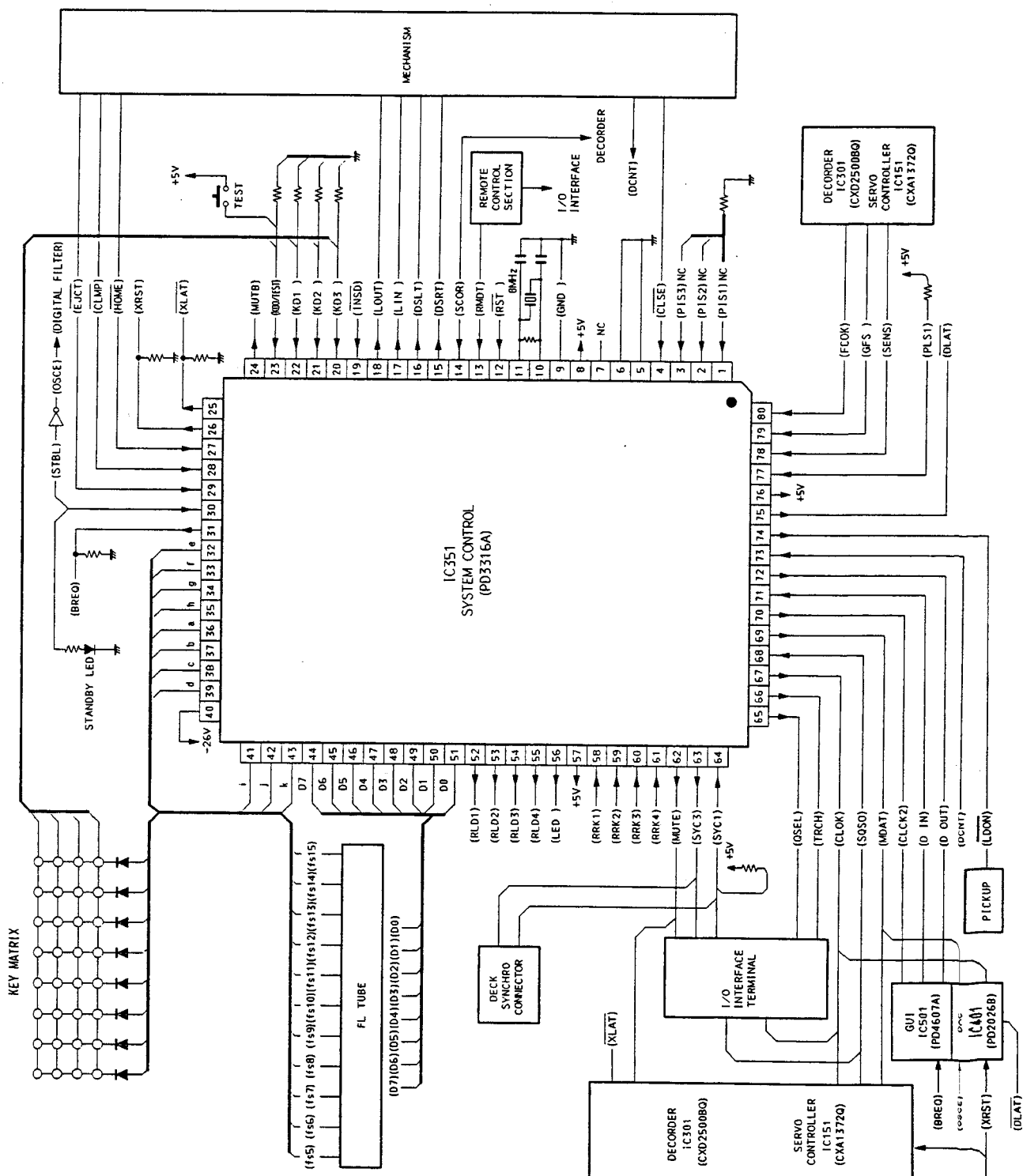
No.	Symbol	Pin Name	I/O	Description
1   3	P04/AN4   P06/AN6	P1S1   P1S3	I	Connected to GND. (+1 disc detection input)
4	P07/AN7	CLSE	I	Door close OK SW (L: Close OK)
5	AVss	No use	GND	(Reference voltage for A/D converter): GND
6	TEST	No use	GND	(Test terminal for maker): GND
7	X2	No use	—	(Sub clock oscillator connected terminal): OPEN
8	X1	No use	+5V	(Sub clock oscillator connected terminal): Vcc
9	Vss	Vss	GND	GND
10	OSC1	OSC1	—	Connected to System clock oscillator (8MHz)
11	OSC2	OSC2		
12	RES	RST	I	CPU reset (L: Reset)
13	P10/IRQ0	RDMT	I	Remote control data input (For I/O INTERFACE)
14	P11/IRQ1	SCOR	I	Sub code sinc S0+S1 input
15	P12/IRQ2	DRST	O	Selector output port Right direction (DRST: H, DSLT: L) Left direction (DRST: L, DSLT: H)
16	P13/IRQ3	DSLTL		
17	P14/IRQ4	LIN	O	Loading output port Clump (LIN: L, LOUT: H) Return (LIN: H, LOUT: L)
18	P15/IRQ5 /TMOE	LOUT		
19	P16/EVENT	INSD	I	Slider INSIDE SW input (L: INSIDE)
20   22	P33/FS27   P31/FS25	KD3   KD1	I	Key • data input
23	P30/FS24	KD0/TEST	I	Key • data input TEST mode request input (H: TEST, L: Normal mode)

No.	Symbol	Pin Name	I/O	Description
24	P47/FS23	MUTB	O	Muting output (L: MUTE)
25	P46/FS22	XLAT	O	LSI control data ratch pulset
26	P45/FS21	XRST	O	Reset output for each LSI
27	P44/FS20	HOME	I	Disc selector home SW (L: Home)
28	P43/FS19	CLMP	I	Clump SW (L: Clump OK)
29	P42/FS18	EJCT	I	Loading out SW (L: Loading out OK)
30	P41/FS17	STBL	O	Stand-by LED light-up output (H: Light-up, OSCE output)
31	P40/FS16	BREQ	O	Request port for sub micro- computer (H: transmission)
32   35	P50/FS15   P53/FS12	SEG E   SEG H	O	Segment output for FL drive
36   39	P54/FS11   P57/FS8	SEG A   SEG D		
40	P17/Vdisp	Vdisp	I	−26V
41   43	P60/FD0/FS7   P62/FD2/FS5	SEG I   SEG K	O	Segment output for FL drive
44   48	P63/FD3/FS4   P67/FD7/FS0	D7   D3	O	Digit output for FL drive
49   51	P70/FD8   P72/FD10	D2   D0		
52	P73/FD11	RLD1	O	LED light-up output for Rack1 (L: light-up)
53	P74/FD12	RLD2	O	LED light-up output for Rack2 (L: light-up)
54	P75/FD13	RLD3	O	LED light-up output for Rack3 (L: light-up)
55	P76/FD14	RLD4	O	LED light-up output for Rack4 (L: light-up)

No.	Symbol	Pin Name	I/O	Description
56	P77/FD15	LED	O	Output for LED light-up
57	Vcc	Vcc	—	+5V
58	P80	RRK1	I	Rack1 Yes/No SW (L: No)
59	P81	RRK2	I	Rack2 Yes/No SW (L: No)
60	P82	RRK3	I	Rack3 Yes/No SW (L: No)
61	P83	RRK4	I	Rack4 Yes/No SW (L: No)
62	P84	MUTE	O	Muting OUTPUT (H: MUTE) (For I/O INTERFACE)
63	P85	SYC3	O	DECK SYNCHRO signal output (For I/O INTERFACE)
64	P86	SYC1	I	DECK SYNCHRO signal input (For I/O INTERFACE)
65	P87	QSEL	O	Signal output for QDATA discrimination (H: During output of Q DATA) (For I/O INTERFACE)
66	P90/PWM	TRCH	O	Data serial output (For I/O INTERFACE)
67	P91/SCK1	CLOK	O	LSI serial clock output (For I/O INTERFACE)
68	P92/SI1	SQSO	I	Sub code Q data serial input (For I/O INTERFACE)
69	P93/SO1	MDAT	O	LSI control data serial output
70	P94/SCK2	CLCK2	O	Clock for sub micro-computer
71	P95/SI2/CS	D IN	I	Data input for sub micro-computer
72	P96/SO2	D OUT	O	Data output for sub micro- computer
73	P97/UD	DCNT	I	Disc count pulse input
74	PA0	LDON	O	Laser diode output (L: ON, H: OFF)
75	PA1	DLAT	O	DAC control data ratch pulse

No.	Symbol	Pin Name	I/O	Description
76	AVcc	AVcc	+5V	+5V
77	PO0/AN0	PLS1	I	Connected to +5V. (Switching port for +1 disc model)
78	PO1/AN1	SENS	I	LSI operating status multi-mode input
79	PO2/AN2	GFS	I	Frame sync lock input (H: OK)
80	PO3/AN3	FCOK	I	Focus OK input (H: OK)

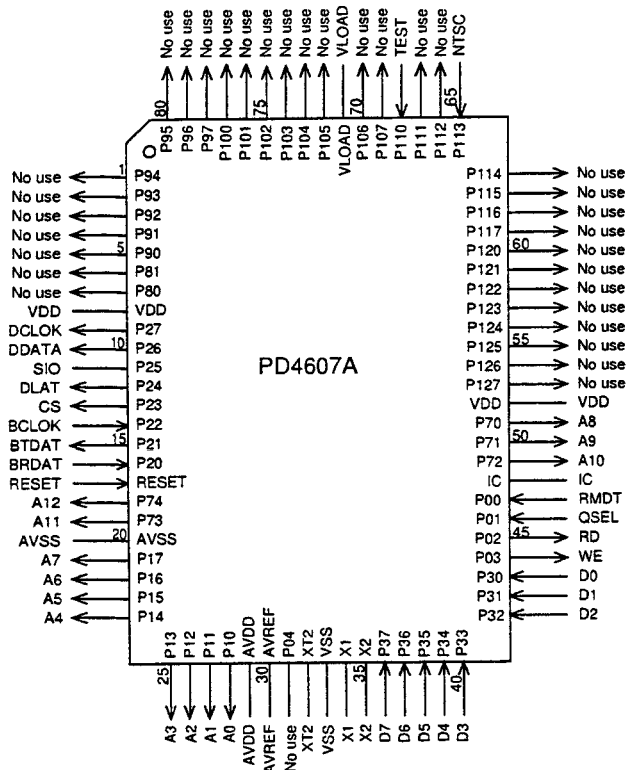
● Block Diagram



# ■ PD4607A (IC501 : MAIN BOARD ASSY)

## ● GUI Screen Control IC, CMOS

### ● Pin Assignment (Top View)



### ● Pin Function

No.	Symbol	Pin Name	I/O	Description
1	P94/FIP6	No use	O	Open
5	P90/FIP2	No use	O	Open
6	P81/FIP1	No use	O	Open
7	P80/FIP0	No use	O	Open
8	VDD	VDD	+5V	+5V
9	P27/SCK0	DCLOCK	O	Serial clock output
10	P26/S00/SB1	DDAT	O	Data output to graphics IC
11	P25/SI0/SB0	SI0	I	Three line type data communication use
12	P24/BUSY	DLAT	O	Lutch output (L: Latch)
13	P23/STB	CS	O	Chip select (H: Stand-by)
14	P22/SCK1	BCLOCK	I	Serial clock input
15	P21/SO1	BTDAT	O	Data output to Bank CD
16	P20/SI1	BRDAT	I	Data input from Bank CD

No.	Symbol	Pin Name	I/O	Description
17	RESET	RESET	I	CPU reset
18	P74	A12	O	Address line to external RAM
19	P73	A11	O	Address line to external RAM
20	AVSS	AVSS	GND	GND
21	P16/ANI7	A7	O	Address line to external RAM
28	P10/ANI0	A0	O	Address line to external RAM
29	AVDD	AVDD	+5V	+5V
30	AVREF	AVREF	GND	GND
31	P04/XT1	No use	I	GND
32	XT2	XT2	-	Open
33	VSS	VSS	GND	GND
34	X1	X1		Connected to system clock oscillator (4.19MHz)
35	X2	X2		Connected to system clock oscillator (4.19MHz)
36	P37	D7		
37	P36/BUZ	D6		
38	P35/PCL	D5		
39	P34/T12	D4	I/O	Data line to external RAM
40	P33/T11	D3	I/O	Data line to external RAM
41	P32/TO2	D2	I/O	Data line to external RAM
43	P30/TO0	D0	I/O	Data line to external RAM
44	P03/INTP3/CI0	WE	O	External RAM data write (L: Data write)
45	P02/INTP2	RD	O	External RAM data read (L: Data read)
46	P01/INTP1	QSEL	I	Bank CD information data transmission request (H: transmission request)
47	P00/INTP0/TI0	RMDT	I	Remote control data input

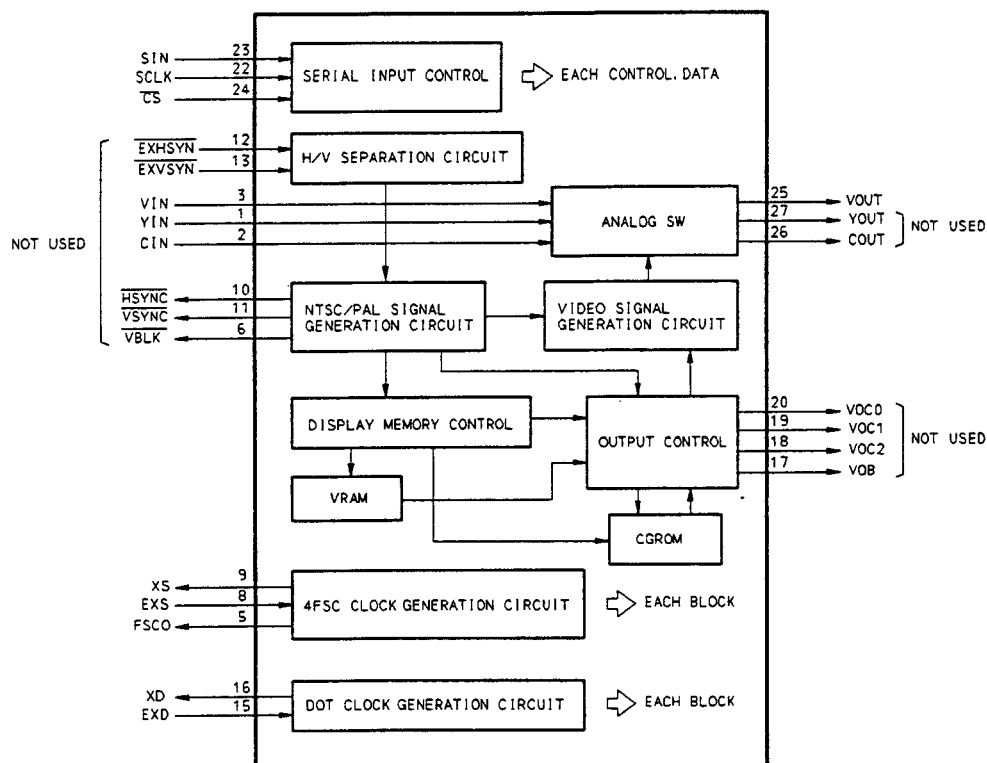
No.	Symbol	Pin Name	I/O	Description
48	IC	IC	GND	GND
49   51	P72   P70	A10   A8	O	Address line to external RAM
52	VDD	VDD	+5V	+5V
53   60	P127/FIP33   P120/FIP26	No use	O	Open
61   64	P117/FIP25   P114/FIP22			
65	P113/FIP21	NTSC	I	Switching NTSC/PAL (H: NTSC, L: PAL)
66	P112/FIP20	No use	O	Open
67	P111/FIP19			
68	P110/FIP18	TEST	I	Test mode information (Graphics IC) (L: Test)
69   70	P107/FIP17   P106/FIP16	No use	O	Open
71	VLOAD	VLOAD	GND	GND
72   77	P105/FIP15   P101/FIP10	No use	O	Open
78   80	P97/FIP9   P95/FIP7			



# **PD6162A (IC503 : MAIN BOARD ASSY)**

## ● GUI Character IC

## ● Block Diagram



## ● Pin Function

No.	Pin Name	I/O	Description
1	YIN	I	Not used Luminance signal input terminal at the time of superimpose display. A DC playback (DC clamped) 2 V <sub>p-p</sub> (sync chip level 1 V, pedestal level 1.57 V) signal is given as input.
2	CIN	I	Not used Saturation signal input terminal at the time of superimpose display. A signal with a DC voltage of 1.57 V and a color burst signal amplitude of 0.57 V <sub>p-p</sub> is given as input.
3	VIN	I	Not used Composite video signal input terminal at the time of superimpose display. A DC playback (DC clamped) 2 V <sub>p-p</sub> (sync chip level 1 V, pedestal level 1.57 V) signal is given as input.
4	AVcc	—	Analog power supply terminal. Same potential as for the Vcc terminal.
5	FSCO	O	This signal indicates the internal color burst phase. Superimpose color display can be executed by controlling the EXS terminal input clock so that the phase of this signal and the color burst phase of the external video signal become the same at the time of external sync control operation. Output control is executed with the FO bit of command 7.
6	$\overline{\text{VBLK}}$	O	Not used Vertical blanking period signal output terminal. Low-level output is executed during the vertical blanking period.
7	Vcc	—	Power supply terminal.



No.	Pin Name	I/O	Description
8	EXS	I	External circuit terminals of the color burst clock generator. A crystal oscillator circuit is formed by external connection of a crystal oscillator (NTSC: 14.31818 MHz, PAL: 17.734475 MHz) and a load capacitance (C).
9	XS	O	
10	$\overline{\text{HSYNC}}$	O	Not used Horizontal sync signal output terminal. Also used as composite sync signal output terminal. By low level for the $\overline{\text{TEST}}$ terminal, the color burst oscillation clock divided by four (fsc) is put out.
11	$\overline{\text{VSYNC}}$	O	Not used Vertical sync signal output terminal. By low level for the $\overline{\text{TEST}}$ terminal, the oscillation clock for the dot clock is put out.
12	$\overline{\text{EXHSYN}}$	I	Not used External horizontal sync signal input terminal. Also used as composite sync signal output terminal. This is a hysteresis input with internal pull-up.
13	$\overline{\text{EXVSYN}}$	I	Not used External vertical sync signal input terminal. This is a hysteresis input with internal pull-up.
14	Vss	—	Ground terminal
15	EXD	I	External circuit terminals for the display dot clock generator. An LC oscillation circuit is formed by external connection of L and C.
16	XD	O	
17	VOB	O	Not used Character + background period signal output terminal. At the time of internal sync control operation, all output periods for characters, character background, line background, and screen background are shown. At the time of external sync control operation, the output periods for characters, character background, and line background are shown.
18	VOC2	O	Not used Color signal output terminals. Character color, character background color, line background color, and screen background color are put out.
19	VOC1		
20	VOC0		
21	$\overline{\text{TEST}}$	I	Test signal input terminal. Normally high level (fixed) is given as input. (Do not issue a command in case of input of low level.)
22	SCLK	I	Shift clock input terminal for serial transfer. This is a hysteresis input with internal pull-up.
23	SIN	I	Serial data input terminal. This is a hysteresis input with internal pull-up.
24	$\overline{\text{CS}}$	I	Chip select terminal. This is set to low level for serial transfer. Also used for cancellation of power-on reset. This is a hysteresis input with internal pull-up.
25	VOUT	O	Composite video signal output terminal. A 2 Vp-p (sync chip level 1 V, pedestal level 1.57 V) signal is put out.
26	COUT	O	Not used Saturation signal output terminal. A signal with a DC voltage of 1.57 V and a color burst signal amplitude of 0.57 Vp-p is put out.
27	YOUT	O	Not used Luminance signal output terminal. A 2 Vp-p (sync chip level 1 V, pedestal level 1.57 V) signal is put out.
28	AVss	—	Analog ground terminal. Same potential as Vss.

## 5. ADJUSTMENTS

*Note: Adjustment of PD-F1004/KU/CA is the same as that of PD-F904/KU/CA except for the following:*

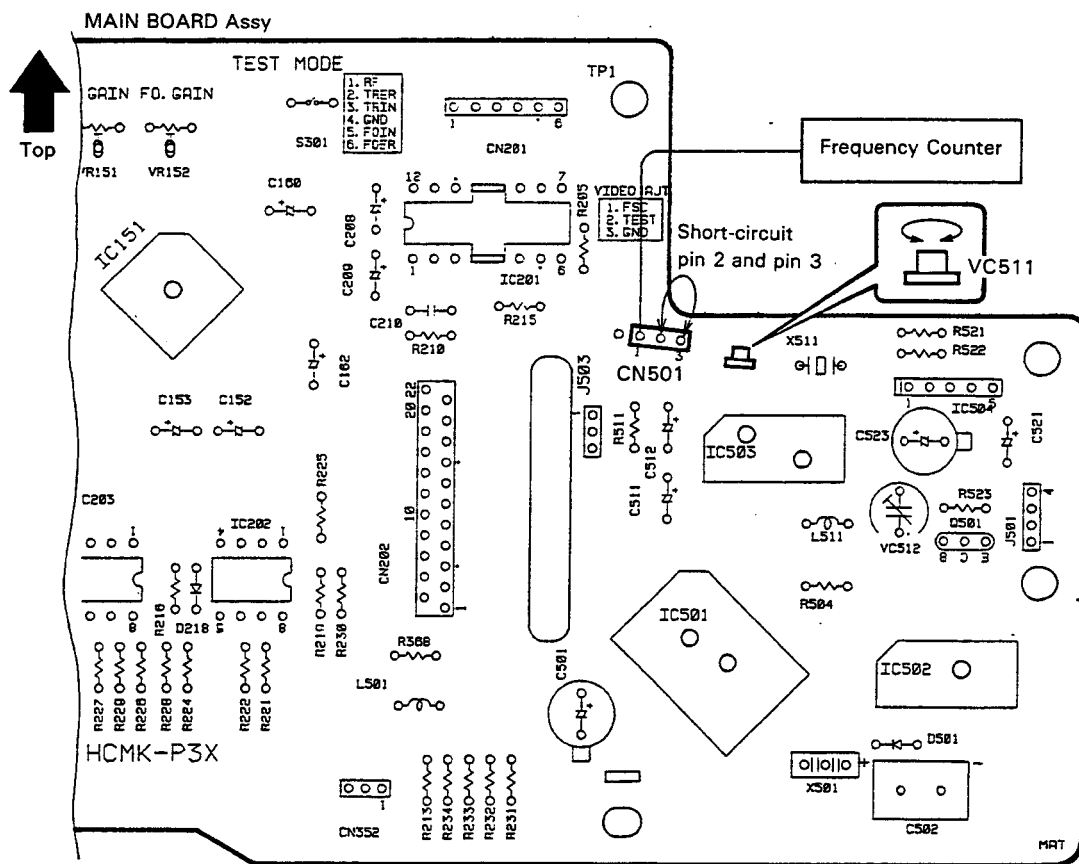
## CHROMA FREQUENCY ADJUSTMENT

Symptom when out of adjustment:

The TV picture is not in color (Black-and-white picture).

## Procedure

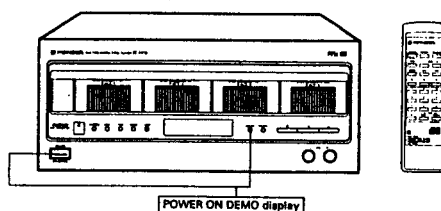
1. Short-circuit pin 2 and pin 3 of connector CN501 of the MAIN BOARD assy.
2. Connect a frequency counter to pin 1 of CN501. Adjust VC511 so that the frequency is within  $3.579545 \text{ MHz} \pm 5 \text{ Hz}$ .





PION-04463

# Service Manual



ORDER NO.  
RRV1225

## FILE-TYPE COMPACT DISC PLAYER PD-F904

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	PD-F904		
KU/CA	○	AC120V	

## CONTENTS

1. SAFETY INFORMATION .....	2	7. OPERATING DESCRIPTION .....	24
2. SPECIFICATIONS .....	3	8. ADJUSTMENTS .....	28
3. PANEL FACILITIES .....	4	9. SCHEMATIC AND PCB CONNECTION	
4. DISASSEMBLY .....	5	DIAGRAMS .....	37
5. EXPLODED VIEWS, PACKING AND		10. BLOCK DIAGRAM .....	57
PARTS LIST .....	9	11. FL INFORMATION .....	58
6. PCB PARTS LIST .....	21	12. IC INFORMATION .....	59

# 1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.



## WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).

When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.



## NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols  (fast operating fuse) and/or  (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

## REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible  (fusible de type rapide) et/ou  (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

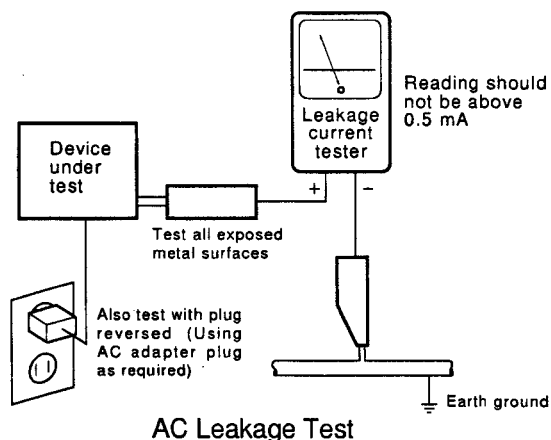
(FOR USA MODEL ONLY)

## 1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

### LEAKAGE CURRENT CHECK


Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5 mA.



**ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.**

## 2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

## 2. SPECIFICATIONS

### 1. General

Type .....	Compact disc digital audio system
Power requirements .....	AC 120 V, 60 Hz
Power consumption .....	12 W
Operating temperature .....	+5°C - +35°C (+41°F - +95°F)
Weight .....	11.0 kg (24 lb 4 oz)
External dimensions .....	420(W) X 399(D) X 190(H) mm 16-9/16(W) X 15-11/16(D) X 7-1/2(H) in

### 2. Audio section

Frequency response .....	2 Hz - 20 kHz
S/N ratio .....	98 dB or more (EIAJ)
Dynamic range .....	96 dB or more (EIAJ)
Channel separation .....	96 dB or more (EIAJ)
Harmonic distortion .....	0.003 % or less (EIAJ)
Level difference between channels .....	1.0 dB or less (EIAJ)
Output voltage .....	2 ± 0.3 Vrms (EIAJ)
Wow and flutter .....	less than ±0.001% (W.PEAK) (below measurable level) (EIAJ)
Channels .....	2-channel (stereo)

### 3. Output terminal

Audio line output  
Control input/output jacks  
CD-DECK SYNCHRO jack  
I/O INTERFACE

### 4. Functions

Number of discs to be stored - maximum 100.

Basic Operation Buttons

- PLAY, PAUSE, STOP

Playback mode

- All Playback Mode
- Single Playback Mode
- Custom Playback Mode

Search Function

- Disc Search
- Track Search
- Manual Search

Programming

- Maximum 32 steps
- Pause
- Program Clear (single track or all tracks)

Repeat Functions

- 1 Track Repeat
- Single Repeat
- All Discs Repeat
- Program Repeat
- Single Random Repeat
- All Discs Random Repeat
- Custom Random Repeat
- Custom Repeat

Random Play

- Random Play (repeat also available)

Switching Display

Disc/Track Number, Time Consumed (track/disc), and Total Time

ADLC

Automatic Digital Level Controller

Memory Hold

Stored Playback Mode, Program Contents, or Custom Mode

Last Disc Memory

Direct Search with the Digit buttons (remote control unit)

Power On/Off (remote control unit)

CD-DECK SYNCHRO jack

Remote Control jack

### 5. Display

FL Tube Display

- ► indicator
- || indicator
- Playback Mode indicators (all, single, custom)
- Elapsed Time Display (min, sec)
- Total Time Display
- Disc Number, Track Number
- Program Step Number
- Custom Number
- Repeat indicator
- Random indicator
- Program indicator
- ADLC indicator

### 6. Accessories

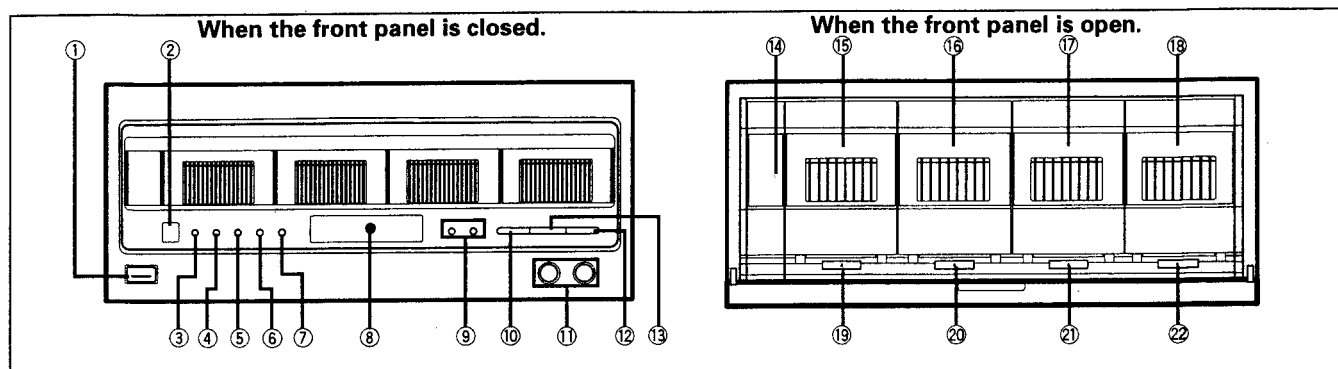
● Remote control unit .....	1
● AAA/R03 dry cell batteries .....	2
● Output cable .....	1
● Control cable .....	1
● Electrostatic charge removal sheet .....	1
● Operating instructions .....	1
● Index label sheet .....	1
● CD liner notes file .....	1

#### NOTE:

Specifications and design subject to possible modification without notice, due to improvements.

## 3. PANEL FACILITIES

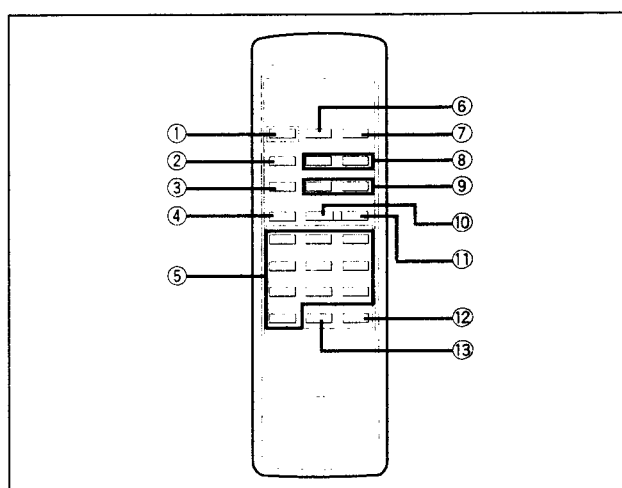
### FRONT PANEL



- ① **POWER STANDBY/ON switch**
- ② **Remote sensor**  
Receives the signal from the remote control unit.

- ③ **RANDOM button**
- ④ **ADLC button**
- ⑤ **TIME button**
- ⑥ **MODE button**
- ⑦ **CLEAR button**
- ⑧ **Display window**
- ⑨ **Track/Manual search buttons**  
( ◀◀ ◀ / ▶ ▶▶ )
- ⑩ **Stop button ( ■ )**
- ⑪ **DISC buttons ( -/+ )**
- ⑫ **Play button ( ▶ )**
- ⑬ **Pause button ( || )**
- ⑭ **PLAY INDICATOR**
- ⑮ **Rack 1**
- ⑯ **Rack 2**
- ⑰ **Rack 3**
- ⑱ **Rack 4**
- ⑲ **EJECT button for Rack 1 ( ▲ )**
- ⑳ **EJECT button for Rack 2 ( ▲ )**
- ㉑ **EJECT button for Rack 3 ( ▲ )**
- ㉒ **EJECT button for Rack 4 ( ▲ )**

### REMOTE CONTROL UNIT



Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.

- ① **POWER button**
- ② **PGM button**
- ③ **MODE button**
- ④ **Stop button ( ■ )**
- ⑤ **Digit buttons ( 0 - 9 )**
- ⑥ **REPEAT button**
- ⑦ **RANDOM button**
- ⑧ **DISC buttons ( -/+ )**
- ⑨ **Track search buttons ( ◀◀ / ▶▶ )**
- ⑩ **Pause button ( || )**
- ⑪ **Play button ( ▶ )**
- ⑫ **TRACK SET button**
- ⑬ **DISC SET button**

## 4. DISASSEMBLY

### 4.1 REMOVAL OF LOADING MECHANISM ASSY

1. Remove the bonnet. (At this time, return the loading mechanism assy to the home position if it is not in the home position.)
2. Remove the rivet and then remove the rope unit.
3. Remove the four screws ① and then remove the select guide.
4. Remove the flat cable from the connector (CN625), and also remove the rope unit from the loading mechanism assy.
5. Raise the loading mechanism assy and remove it.

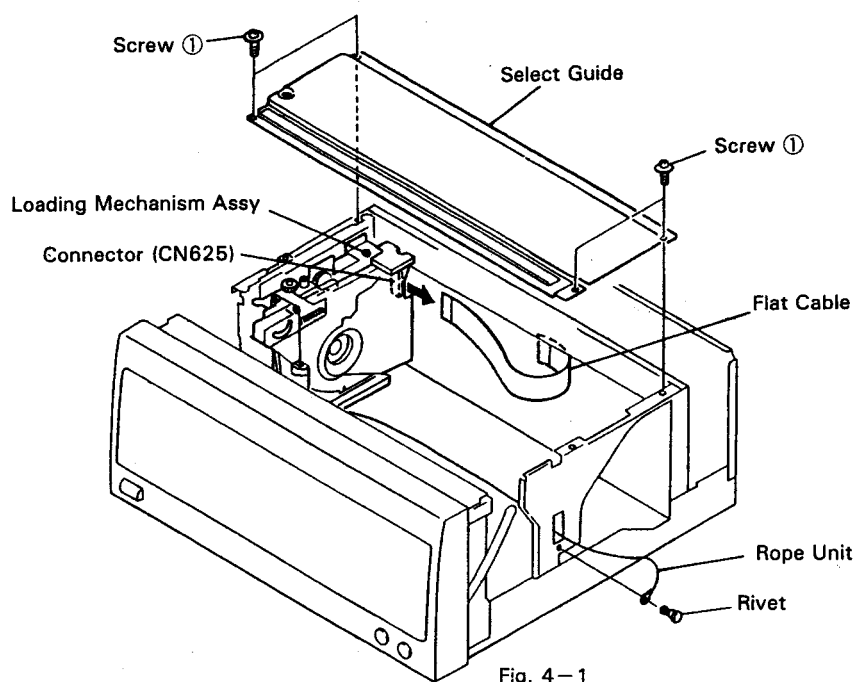


Fig. 4-1

*Note) Execute assembly in reverse order of the disassembly.*

*However, the following items must be executed.*

- Synchronization matching for upper and lower gear

Adjust the relation between the sub gear teeth and the select guide as shown in Fig. 4-2.

- Position confirmation for body and loading mechanism assy

Looking from the top, conform that part ① of the gear angle B and part ② of the angle L are parallel. (Refer to Fig. 4-3.)

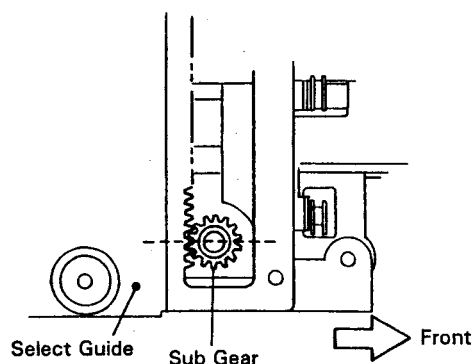


Fig. 4-2

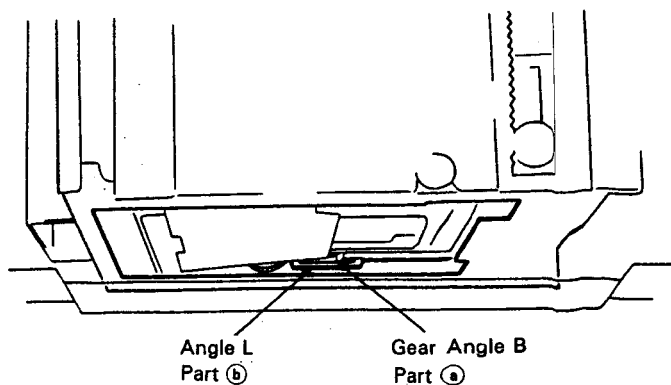


Fig. 4-3

## 4.2 REMOVAL OF SERVO MECHANISM ASSY

1. Remove the loading mechanism assy. [Refer to "4.1 REMOVAL OF LOADING MECHANISM ASSY".]
2. Remove the screw ① and the clamper base.
3. Remove the stopper. (At this time, remove the stopper spring at the same time.)
4. Remove the arm spring.
5. Remove the three screws ③ fixing the D cup, remove the screw ④ fixing the side angle and the connector (CN626), and then remove the D cup and the side angle.
6. Remove arm A, arm B, and the connecting rack.
7. Remove the four screws ⑤ fixing the servo mechanism assy. Remove the flexible circuit board of the pickup assy from the connector (CN621) and pull out the servo mechanism assy.
8. Remove the connector (CN610) of the servo mechanism assy and then remove the servo mechanism assy.

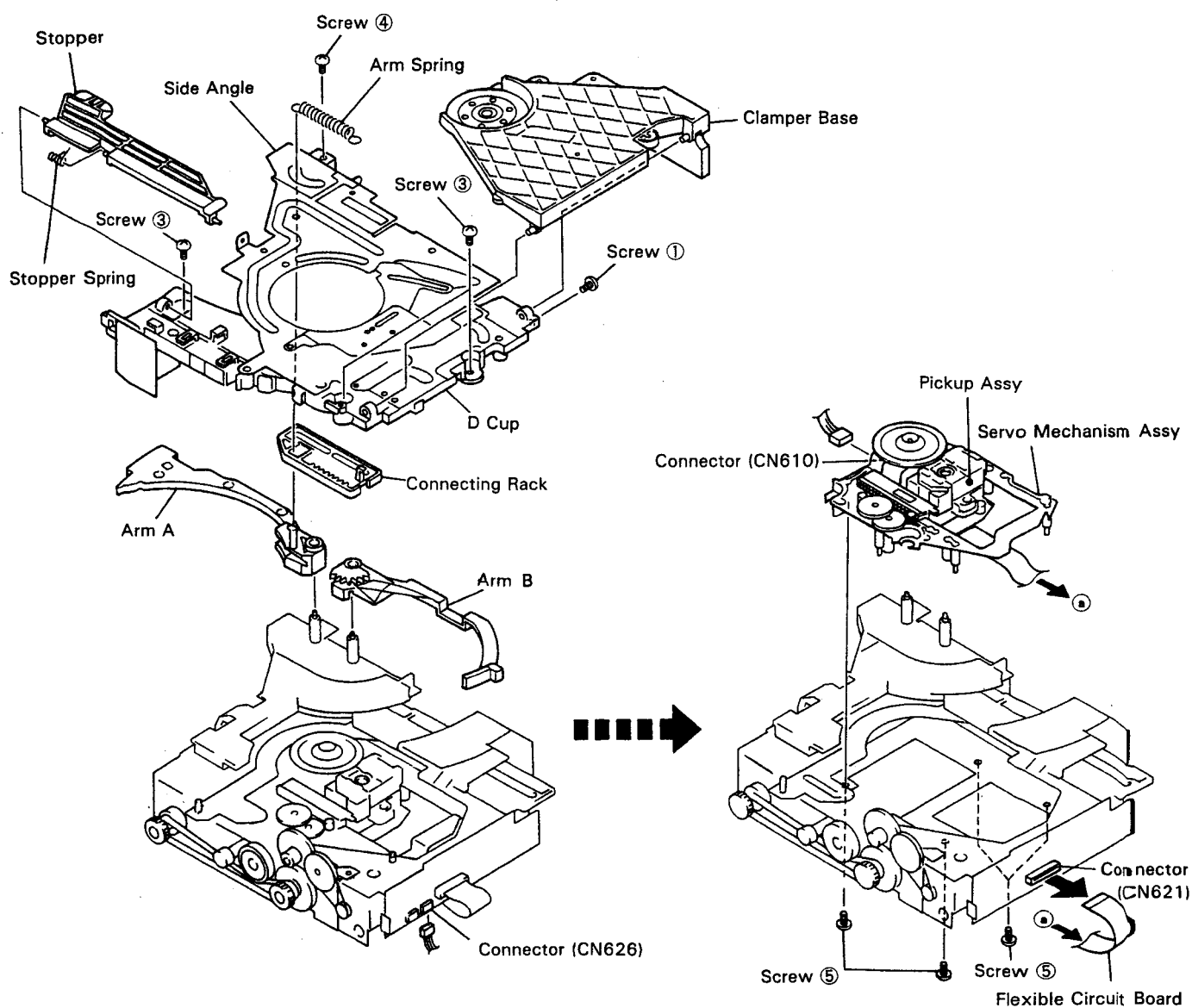


Fig. 4-4



Note) Execute assembly in reverse order of the disassembly.  
However, the following items must be executed.

- Synchronization matching for arm A, arm B and connecting rack

Confirm correct positioning of the drive plate mark and the mark of gear A as shown in Fig. 4-5. If the position is not correct, turn the worm [refer to "4.3 REMOVAL OF BELT A"] to obtain the correct position. Also, install arm A and arm B as shown in Fig. 4-6 and position the connecting rack as shown in Fig. 4-6 (refer to ①), seen from above.

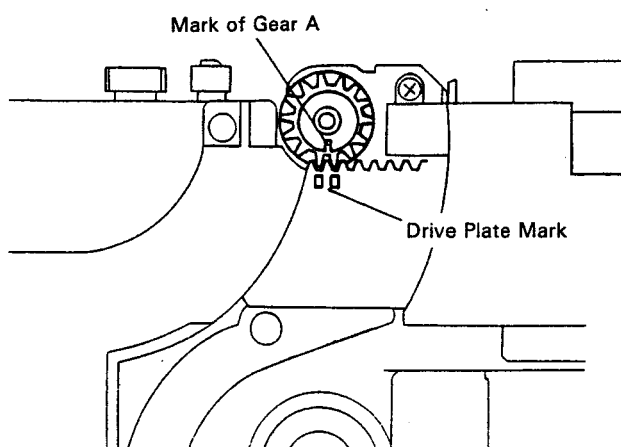


Fig. 4-5

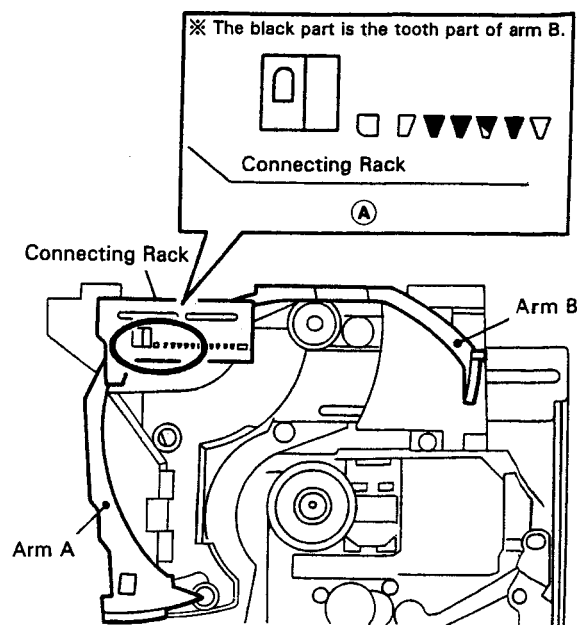


Fig. 4-6

- Select lever position matching

When installing the D cup, pull out the pin of the select lever and insert the lever pin into the select lever hole.

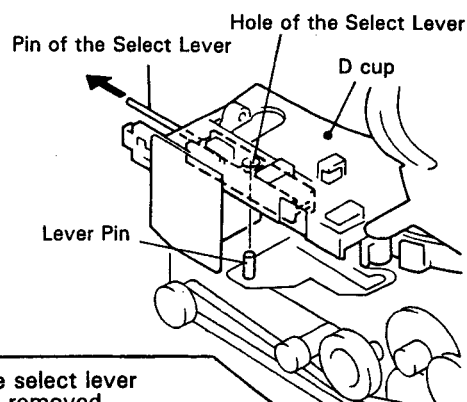


Fig. 4-7

- When the select lever has been removed

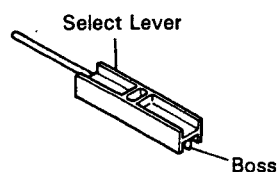


Fig. 4-8

Note: For installation of the select lever, insert it with the boss pointing down.

- Caution items for installation of the clamber base

Bring part ③ of the clamber base onto part ④ of the stopper.

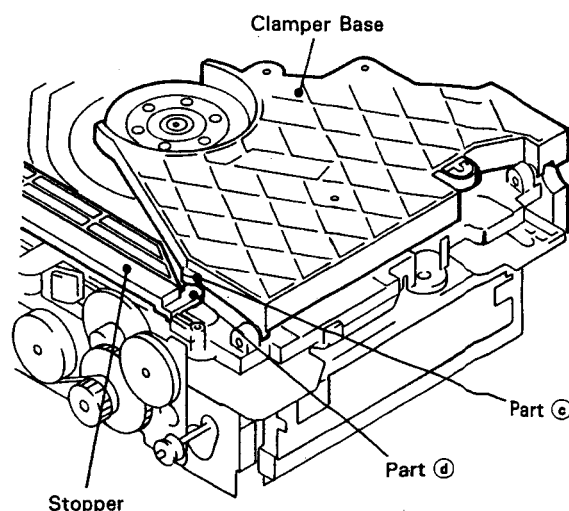


Fig. 4-9

## 4.3 REMOVAL OF BELT A

1. Remove the loading mechanism assy. [Refer to "4.1 REMOVAL OF LOADING MECHANISM ASSY".]
2. Pull the synchro shaft together with the sub gear. (At this time, the synchro gear, the collar, and the timing belt come off together.)
3. Remove the two screws ① fixing the gear angle A and remove the gear angle A. (At this time, the cord clamber also comes off.)
4. Remove the washer fixing the gear A and the worm wheel and remove the belt A.
  - If the work is difficult, remove the connectors (CN641, CN624) and cut the binder to make the work easier.

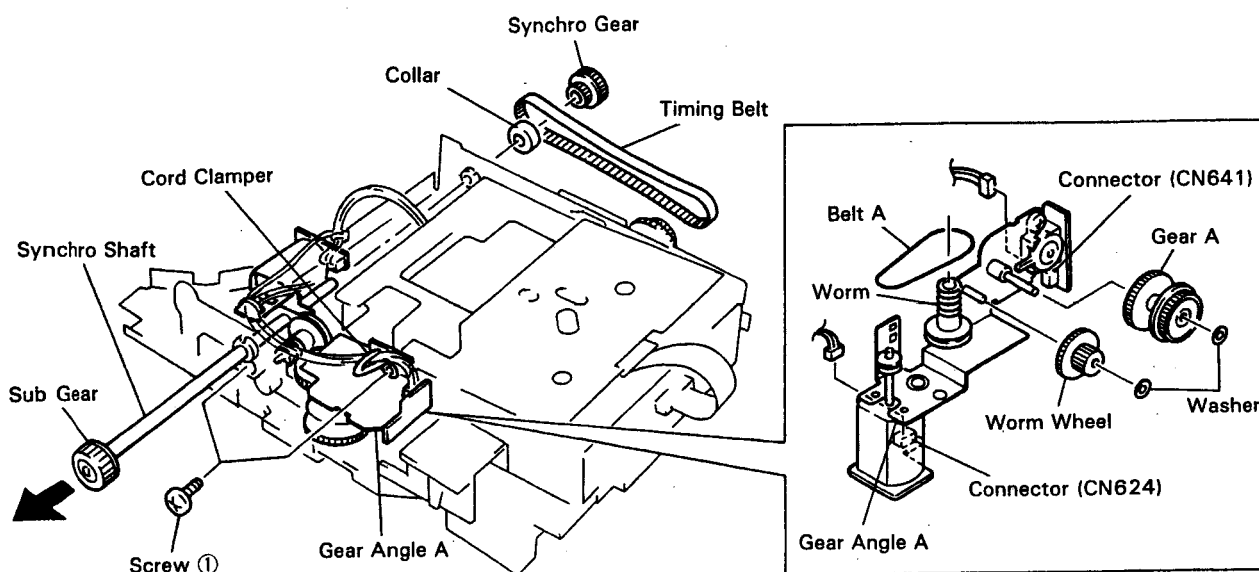


Fig. 4-10

Note) Execute assembly in reverse order of the disassembly.

However, the following items must be executed.

### ● Synchronization matching for gear A and drive plate

Match the drive plate mark and the mark of gear A as shown in Fig. 4-11, and then fix the gear angle A with the screws. (At this time, the lever of the loading switch must be on the upper side of the projection of gear A.)

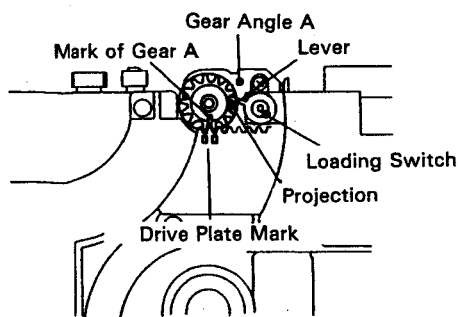


Fig. 4-11

### ● Synchro belt installation

Place the synchro belt as shown in Fig. 4-12 onto the synchro gear S. Place the collar onto the synchro shaft, place the timing belt onto the synchro gear, and press fit the synchro shaft in this condition.

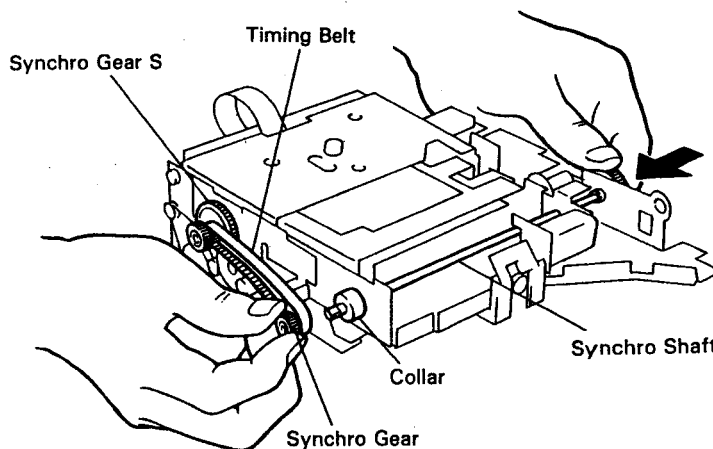


Fig. 4-12

## 5. EXPLODED VIEWS, PACKING AND PARTS LIST

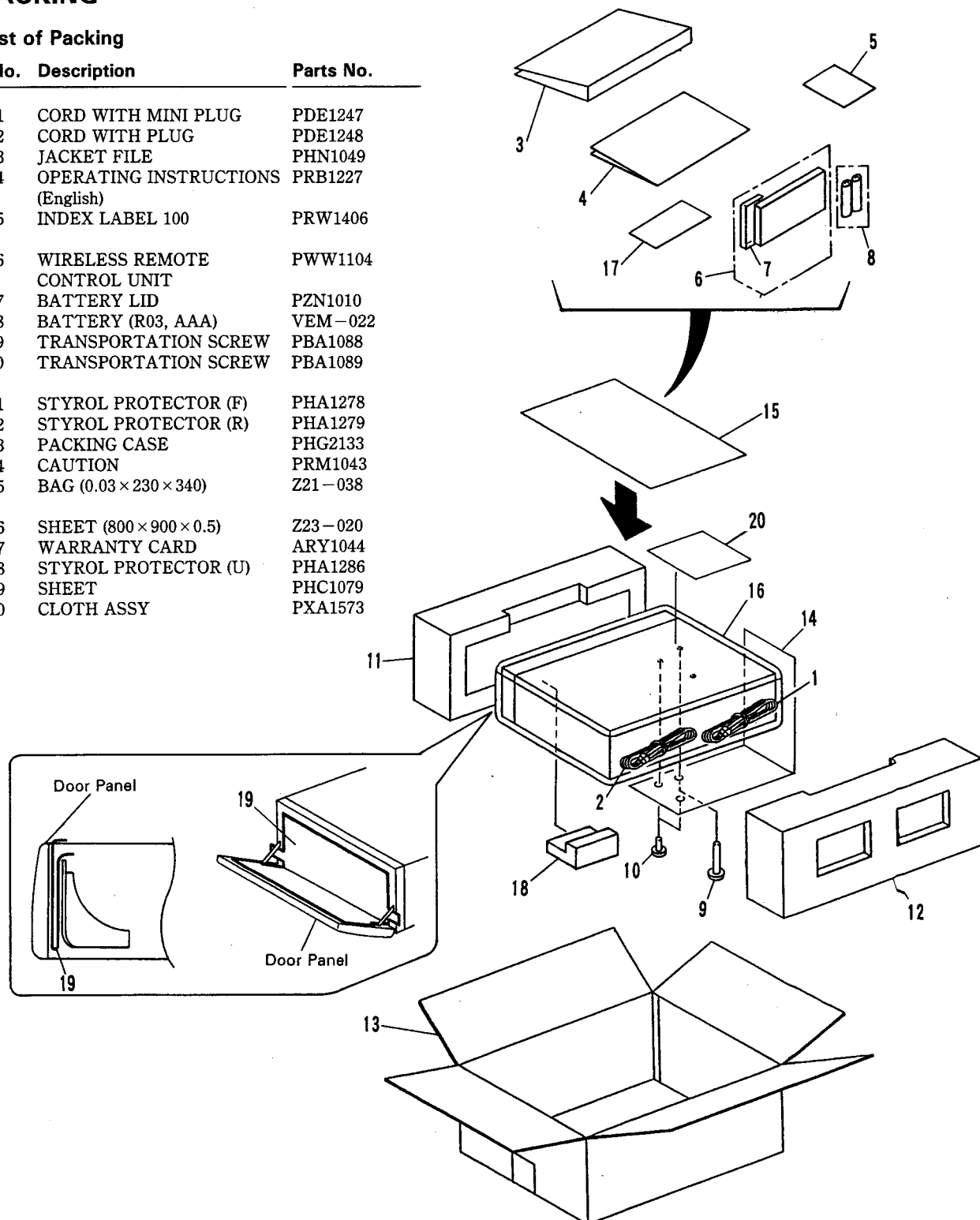
### NOTES :

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\triangle$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

### 5.1 PACKING

#### Parts List of Packing

Mark	No.	Description	Parts No.
	1	CORD WITH MINI PLUG	PDE1247
	2	CORD WITH PLUG	PDE1248
	3	JACKET FILE	PHN1049
	4	OPERATING INSTRUCTIONS (English)	PRB1227
	5	INDEX LABEL 100	PRW1406
	6	WIRELESS REMOTE CONTROL UNIT	PWW1104
	7	BATTERY LID	PZN1010
NSP	8	BATTERY (R03, AAA)	VEM-022
	9	TRANSPORTATION SCREW	PBA1088
	10	TRANSPORTATION SCREW	PBA1089
	11	STYROL PROTECTOR (F)	PHA1278
	12	STYROL PROTECTOR (R)	PHA1279
	13	PACKING CASE	PHG2133
	14	CAUTION	PRM1043
	15	BAG (0.03 × 230 × 340)	Z21-038
	16	SHEET (800 × 900 × 0.5)	Z23-020
NSP	17	WARRANTY CARD	ARY1044
	18	STYROL PROTECTOR (U)	PHA1286
	19	SHEET	PHC1079
	20	CLOTH ASSY	PXA1573



## 5.2 EXTERIOR

### Parts List of Exterior

Mark	No.	Description	Parts No.
△	1	CORD STOPPER (PLASTIC)	CM-22C
	2	LEVER SWITCH (S)	DSK1003
	3	.....	
	4	22P F.F.C/30V	PDD1157
	5	.....	
	6	28P F.F.C/30V	PDD1164
△	7	AC POWER CORD	PDG1015
△	8	POWER TRANSFORMER	PTT1297
	9	.....	
	10	CANCEL SPRING	PBH1173
	11	SUPPORT SPRING	PBH1192
	12	BONNET CASE	PYY1178
NSP	13	UNDER BASE	PNA2057
	14	REAR BASE (FE)	PNA2218
	15	PCB ANGLE	PNB1468
	16	SIDE ANGLE	PNB1469
	17	ESCUTCHEON ANGLE	PNB1502
	18	FFC HOLDER	PNM1274
	19	INSULATOR	PNW1912
	20	ROLLER	PNW2468
NSP	21	SPACER 24 (PLASTIC)	PNW2484
	22	SPACER (PLASTIC)	PNY-404
	23	.....	
	24	RIVET (PLASTIC)	RBM-003
	25	CORD CLAMPER (STEEL)	RNH-184
NSP	26	SPACER	VEC1596
	27	WIRE SPRING	PBH1182
	28	EJECT SPRING	PBH1214
	29	ROPE UNIT	PBL1007
	30	SHAFT	PLA1138
	31	MAIN BASE	PNA2108
	32	REAR ANGLE	PNA2126
	33	SELECT GUIDE	PNB1479
	34	ANGLE L	PNB1516
	35	SIDE ANGLE R	PNB1517
NSP	36	SCREW HOLDER	PNW2489
	37	DISC RACK ASS'Y	PXA1574
	38	GUIDE SPRING	PBH1177
	39	GUIDE PLATE	PNB1476
NSP	40	RACK	PNW2583
NSP	41	TOP GUIDE	PNW2405
	42	RACK PANEL	PNW2406
	43	.....	
	44	RACK WINDOW 1	PAM1674
	45	RACK WINDOW 2	PAM1675
	46	RACK WINDOW 3	PAM1676
	47	RACK WINDOW 4	PAM1677
	48	65 LABEL	ORW1069
	49	ADDRESS LABEL	PRW1359
NSP	50	RACK BASE ASS'Y	PXA1572

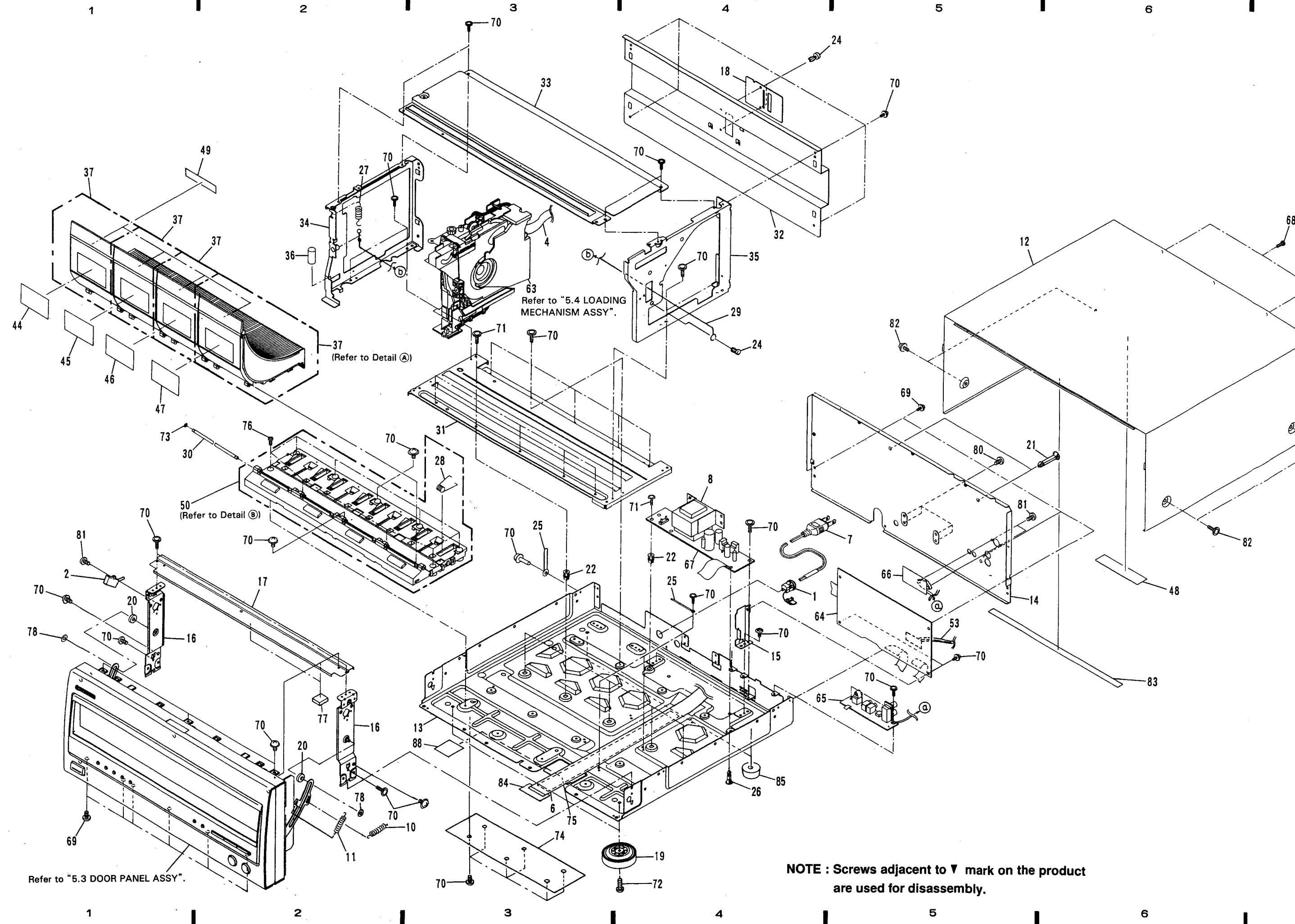
Mark	No.	Description	Parts No.
NSP	51	RACK BOARD A ASSY	PWZ2779
NSP	52	RACK BOARD B ASSY	PWZ2781
	53	CONNECTOR ASSY 5P	PDE1266
	54	CONICAL SPRING	PBH1206
	55	LEVER SPRING	PBH1204
	56	SWITCH PLATE	PBK1131
	57	RACK BASE	PNW2407
	58	RACK LOCK	PNW2565
	59	LOCK LEVER	PNW2409
	60	SCREW	BPZ26P060FZK
	61	STOPPER SCREW	PBA1095
	62	SCREW	PPZ30P060FMC
NSP	63	LOADING MECHANISM ASSY	PXA1571
	64	MAIN BOARD ASSY	PWZ3077
NSP	65	OUTPUT BOARD ASSY	PWZ3080
NSP	66	I/O CONNECTOR BOARD ASSY	PWX1390
	67	POWER BOARD ASSY	PWZ3065
	68	SCREW	BBZ30P100FCC
	69	SCREW	BBZ30P080FCC
	70	SCREW	IBZ30P060FCC
	71	SCREW	IBZ30P150FCC
	72	SCREW	IBZ30P100FCC
	73	E RING	YE30FUC
NSP	74	BOTTOM PLATE	PNB1511
	75	FFC PLATE	PNM1275
	76	SCREW	PBA1099
	77	DISC GUARD	PNM1245
	78	WASHER	WT36D120D050
	79	.....	
	80	SCREW	IBZ30P080FCC
	81	SCREW	BBZ26P060FCC
	82	SCREW	FBT40P080FZK
	83	BONNET GUARD	PNM1244
NSP	84	JOINT BOARD ASSY	PWZ3074
	85	FOOT ASSY	AEC1531
	86	.....	
	87	.....	
	88	ISOLATION SHEET	PNM1270
NSP	89	RUBBER HOLDER	PEB1283
NSP	90	CLIK PLATE	PBK1133
	91	SCREW	Z39-024

A

B

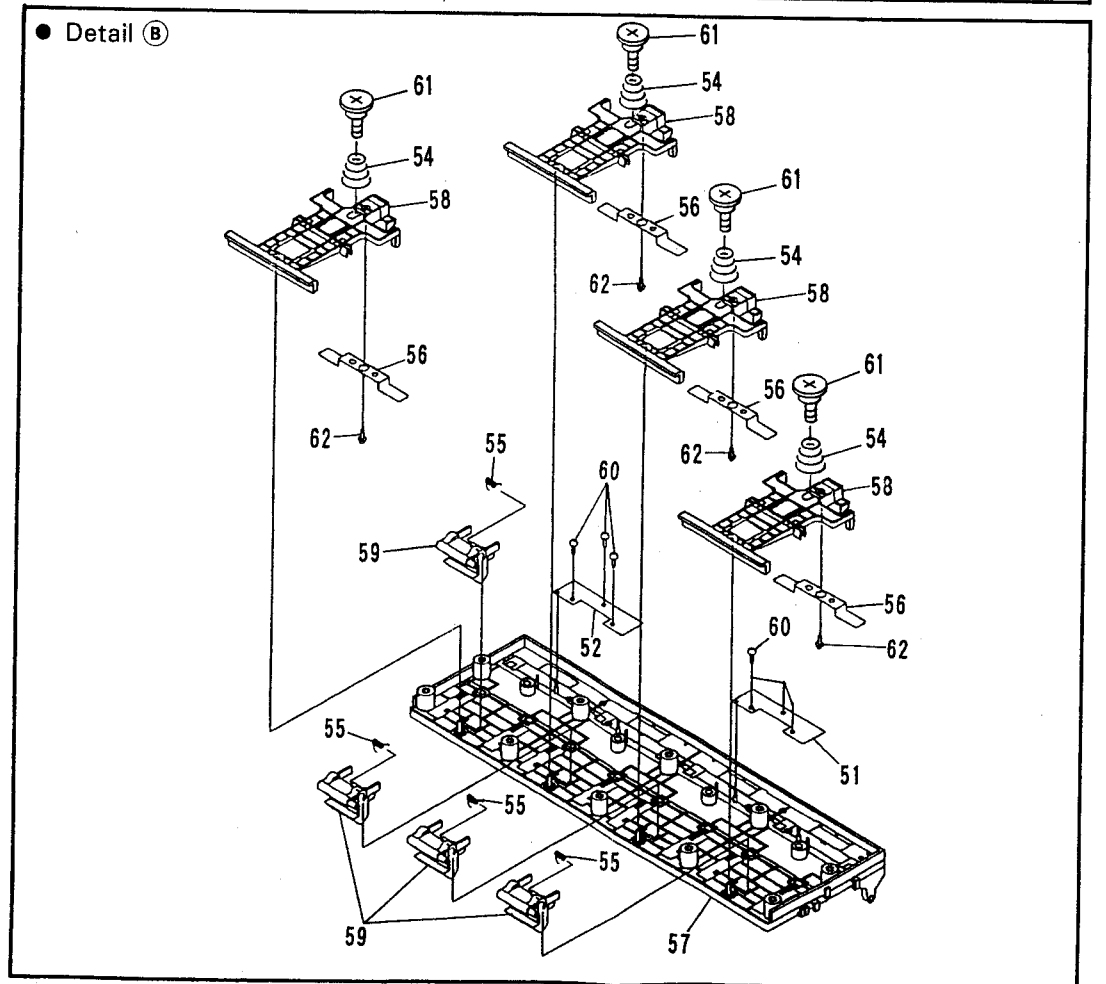
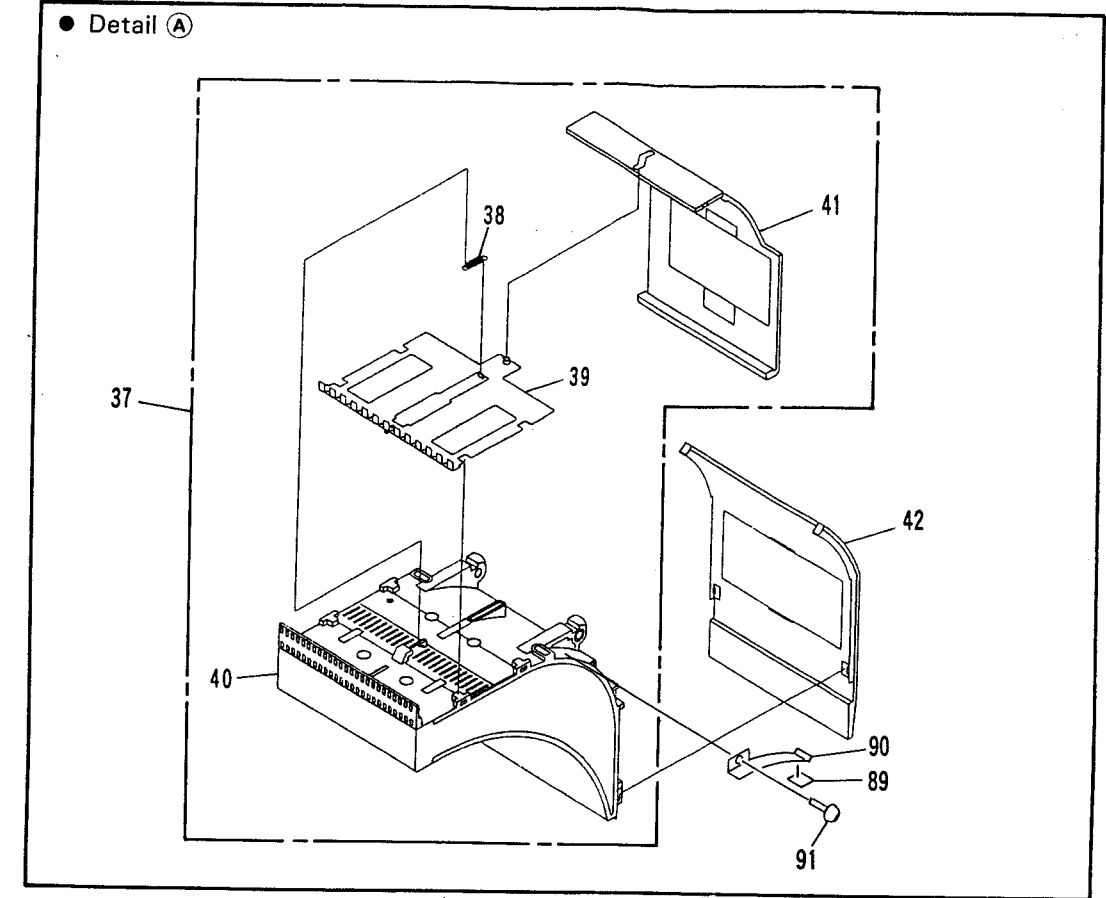
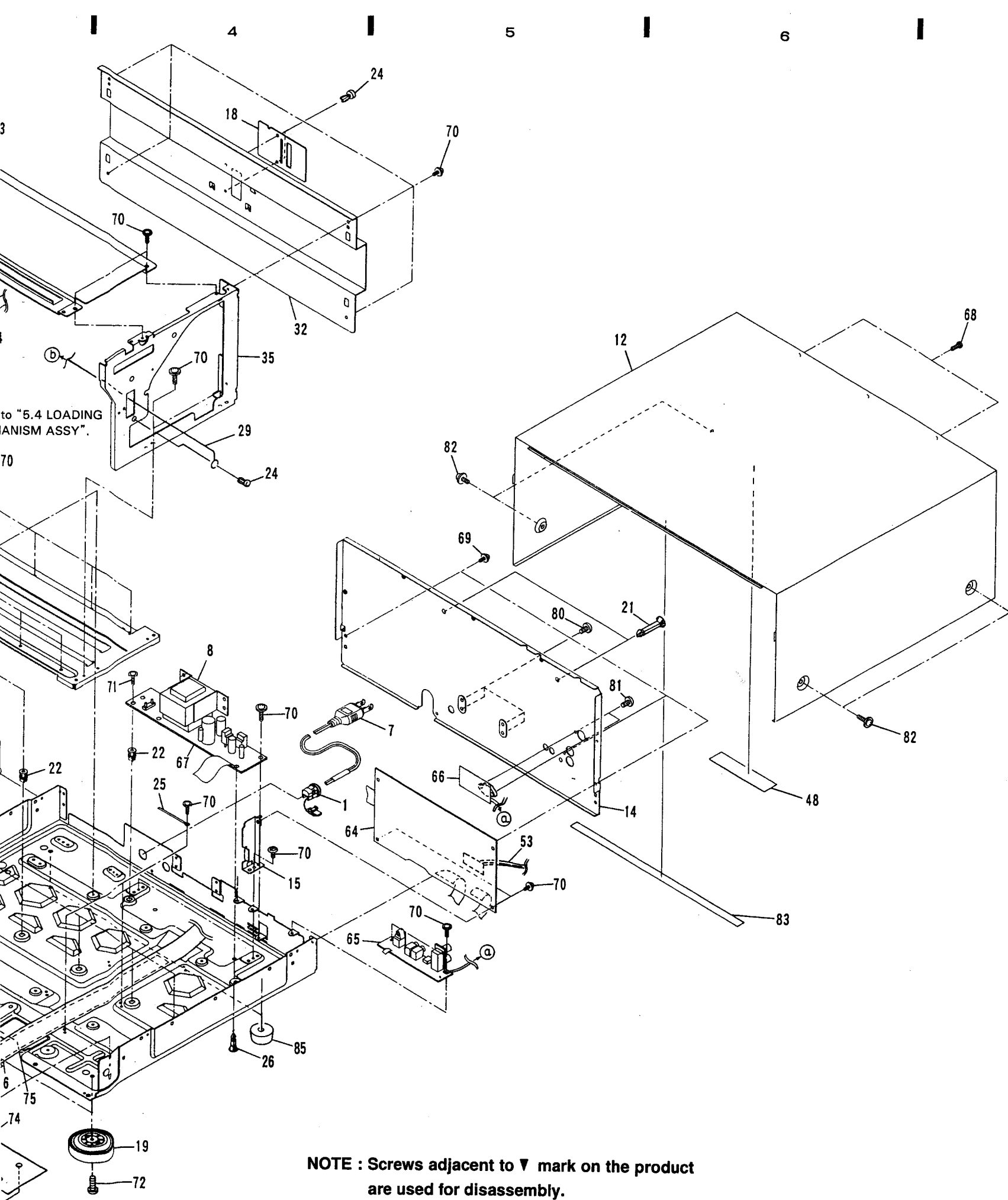
C

D



Refer to "5.3 DOOR PANEL ASSY".

NOTE : Screws adjacent to ▼ mark on the product are used for disassembly.



A

B

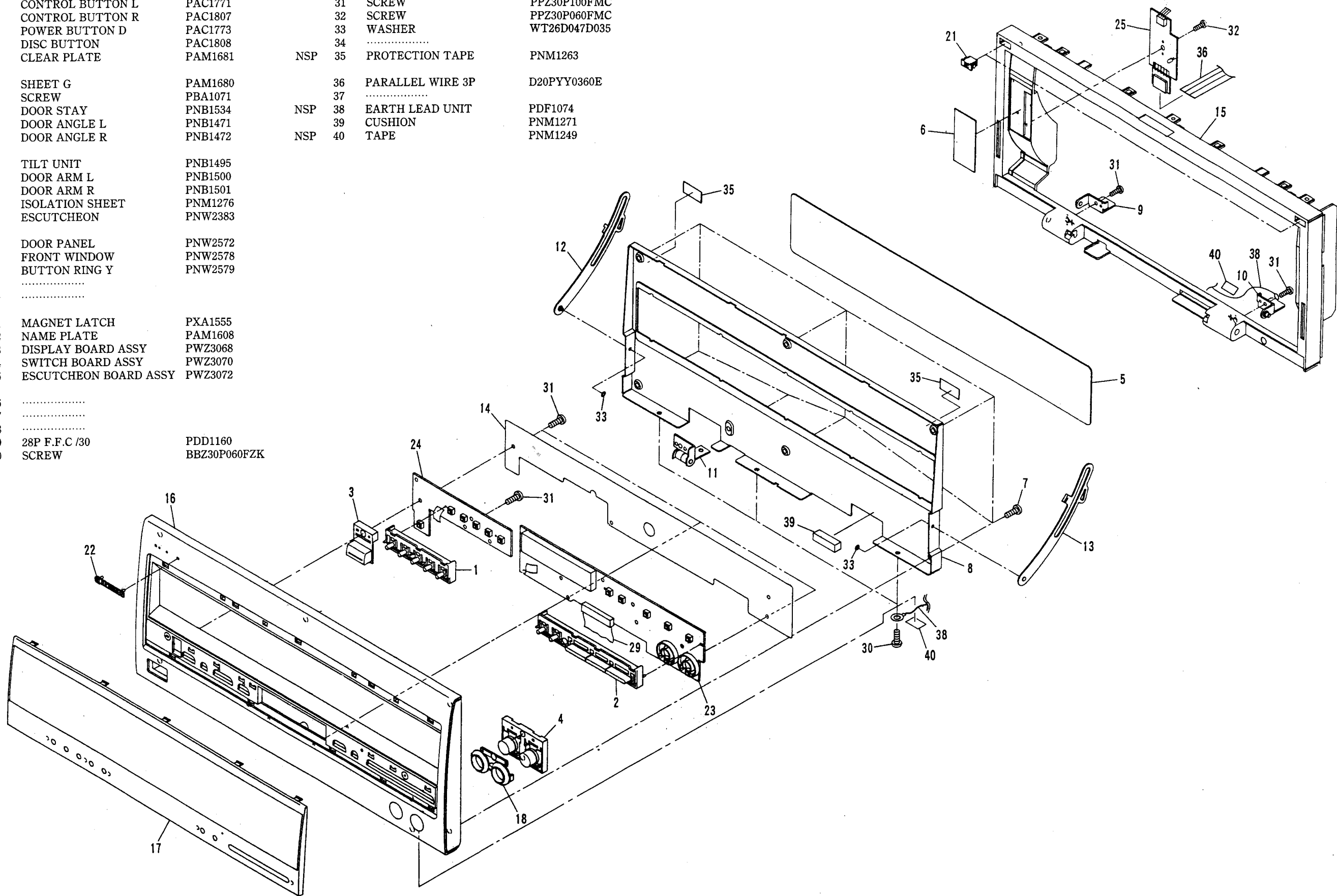
C

D

5.3 DOOR PANEL ASSY

Parts List of Door Panel Assy

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
A	1	CONTROL BUTTON L	PAC1771	31	SCREW	PPZ30P100FMC	
	2	CONTROL BUTTON R	PAC1807	32	SCREW	PPZ30P060FMC	
	3	POWER BUTTON D	PAC1773	33	WASHER	WT26D047D035	
	4	DISC BUTTON	PAC1808	34	.....		
	5	CLEAR PLATE	PAM1681	NSP	35	PROTECTION TAPE	PNM1263
	6	SHEET G	PAM1680	36	PARALLEL WIRE 3P	D20PYY0360E	
	7	SCREW	PBA1071	37	.....		
	8	DOOR STAY	PNB1534	NSP	38	EARTH LEAD UNIT	PDF1074
	9	DOOR ANGLE L	PNB1471	39	CUSHION	PNM1271	
	10	DOOR ANGLE R	PNB1472	NSP	40	TAPE	PNM1249
	11	TILT UNIT	PNB1495				
	12	DOOR ARM L	PNB1500				
	13	DOOR ARM R	PNB1501				
	14	ISOLATION SHEET	PNM1276				
	15	ESCUTCHEON	PNW2383				
B	16	DOOR PANEL	PNW2572				
	17	FRONT WINDOW	PNW2578				
	18	BUTTON RING Y	PNW2579				
	19	.....					
	20	.....					
NSP	21	MAGNET LATCH	PXA1555				
	22	NAME PLATE	PAM1608				
	23	DISPLAY BOARD ASSY	PWZ3068				
	24	SWITCH BOARD ASSY	PWZ3070				
	25	ESCUTCHEON BOARD ASSY	PWZ3072				
	26	.....					
	27	.....					
	28	.....					
	29	28P F.F.C /30	PDD1160				
	30	SCREW	BBZ30P060FZK				



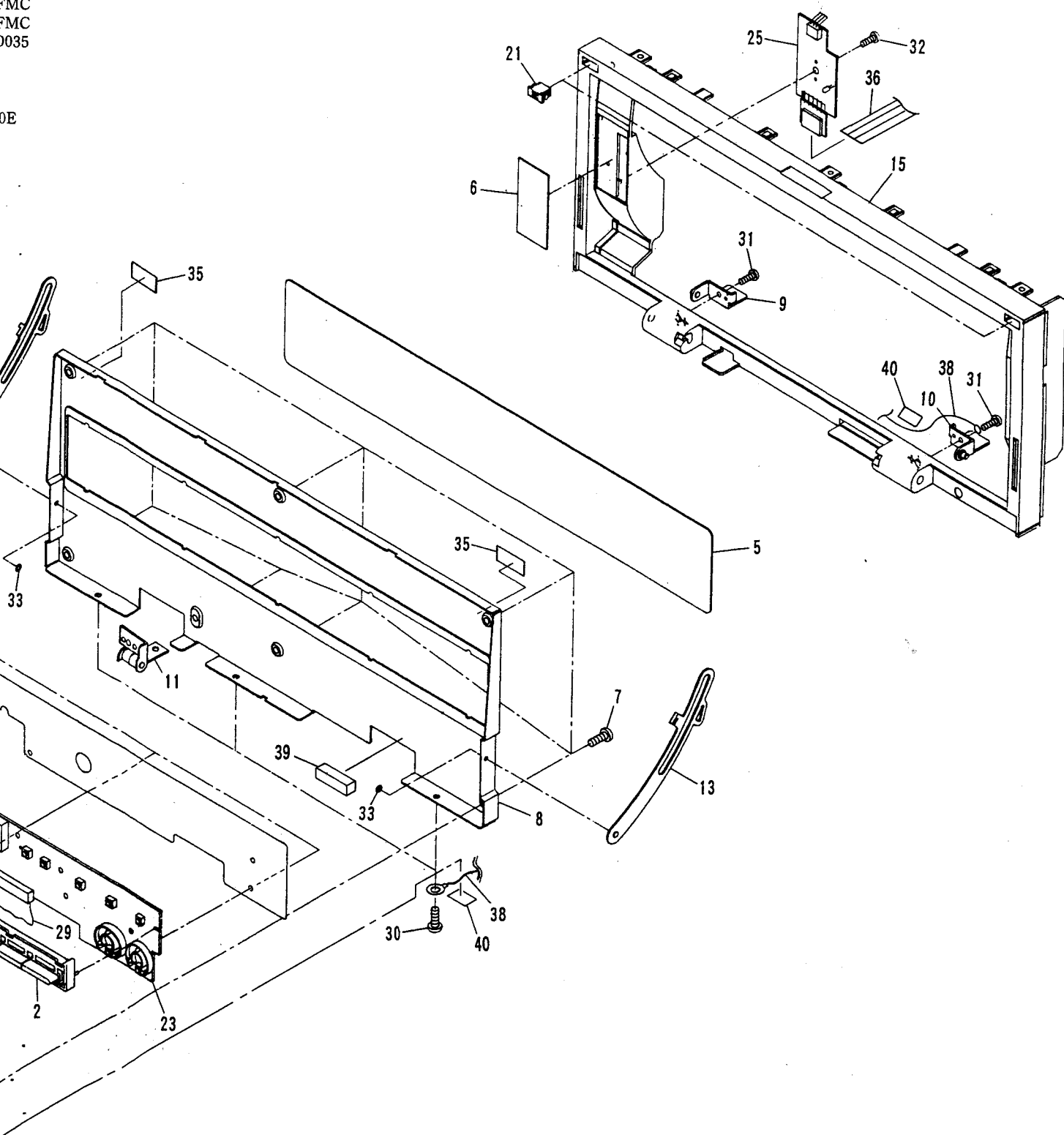
5.4 LOAD  
● EXTERIO

Parts List of

Mark	No.	
NSP	1	
NSP	2	
NSP	3	
NSP	4	
NSP	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
B	14	
NSP	15	
NSP	16	
NSP	17	
NSP	18	
NSP	19	
NSP	20	
	21	
	22	
	23	
	24	
	25	
	26	
	27	
	28	
	29	
	30	
C	31	
	32	
	33	
	34	
	35	
NSP	36	
	37	
	38	
	39	
NSP	40	
	41	
	42	
	43	
	44	
	45	
	46	
D	47	
	48	
	49	
	50	

FMC  
FMC  
0035

DE



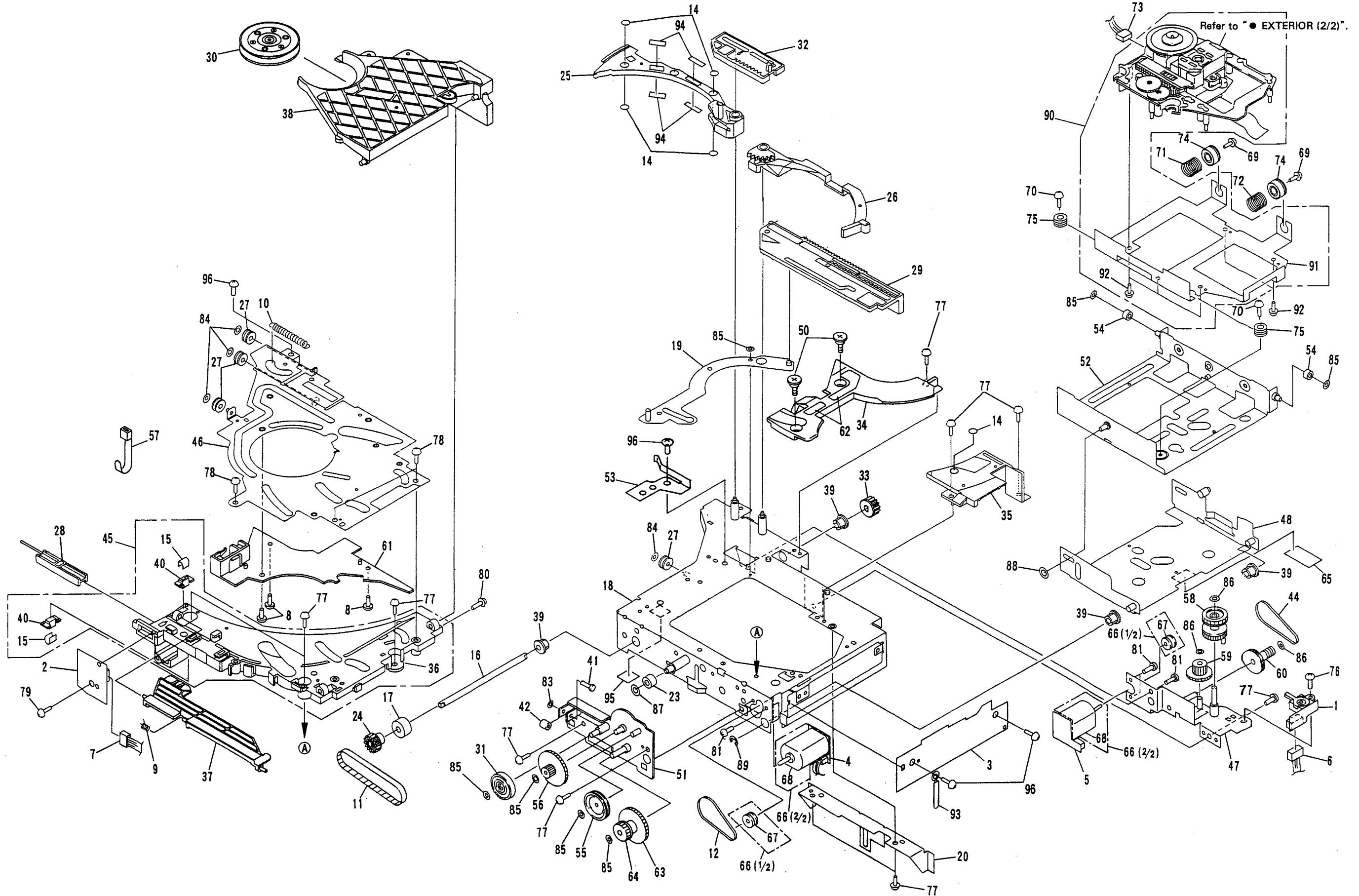
## 5.4 LOADING MECHANISM ASSY

### ● EXTERIOR (1/2)

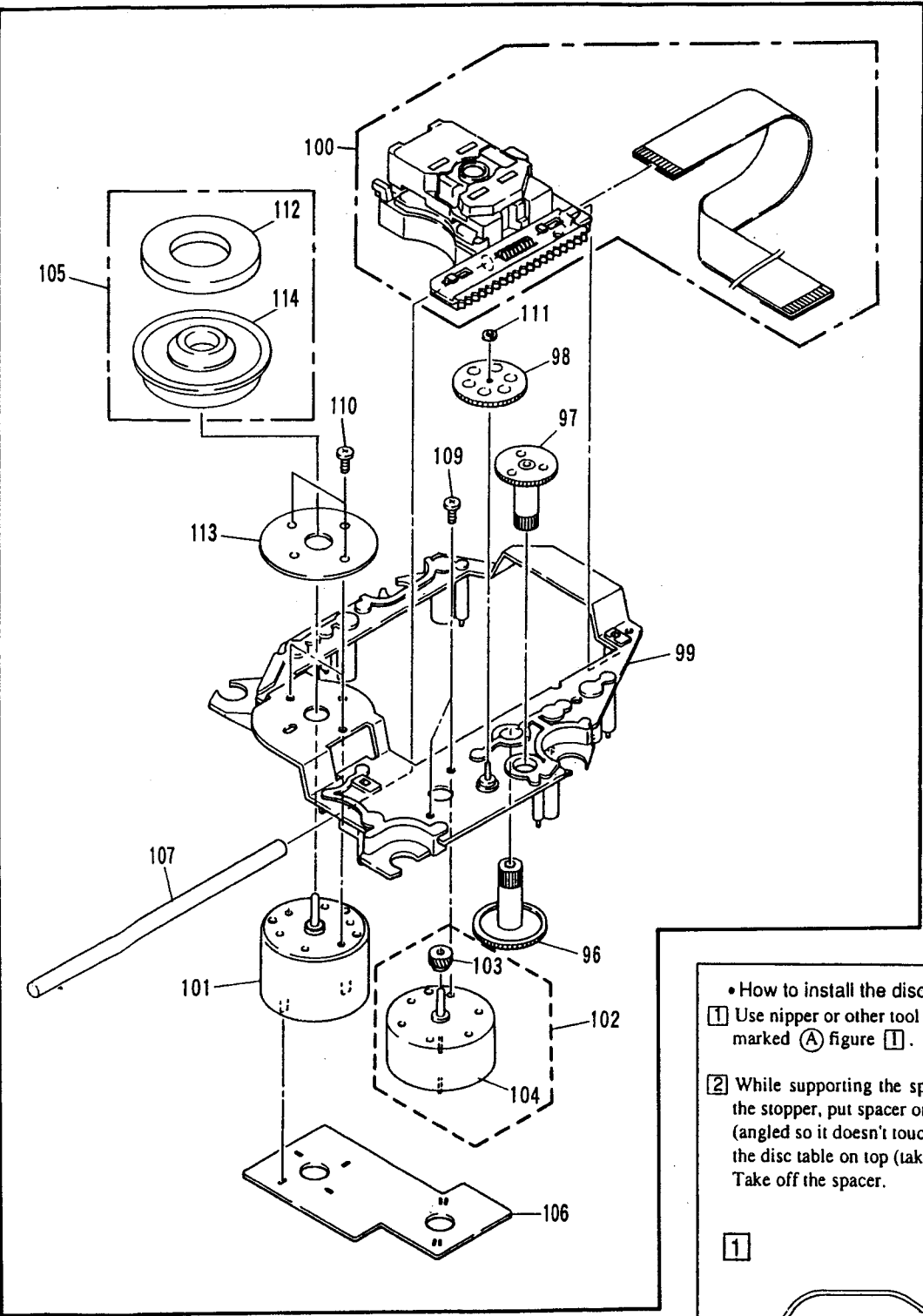
#### Parts List of Exterior (1/2)

A	Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
A	NSP	1	MECHA BOARD ASSY	PWZ2776		51	GEAR ANGLE B	PNB1496
	NSP	2	SENSOR BOARD ASSY	PWZ2777		52	SLIDER	PNB1531
	NSP	3	LOADING BOARD ASSY	PWZ2778		53	UPPER PLATE	PBK1141
	NSP	4	SELECT MOTOR BOARD ASSY	PWZ2782		54	ROLLER	PNW1967
	NSP	5	LOADING MOTOR BOARD ASSY	PWZ2783		55	GEAR PULLEY	PNW2411
		6	CONNECTOR ASSY (3P)	PDE1234		56	GEAR L	PNW2412
		7	CONNECTOR ASSY (4P)	PDE1235		57	BINDER	Z09-056
		8	SCREW	PBA1090		58	GEAR A	PNW2420
		9	STOPPER SPRING	PBH1183		59	WORM WHEEL	PNW2421
		10	ARM SPRING	PBH1202		60	WORM	PNW2422
B		11	BELT	PEB1268		61	C CUP	PNW2537
		12	BELT	PEB1269		62	SHEET	PED1026
		13	.....			63	GEAR S	PNW2433
		14	CUSHION (ART. SUEDE)	PED-049		64	SYNCHRO GEAR S	PNW2434
	NSP	15	CUSHION (ART. SUEDE)	PED1016		65	FLEXIBLE GUARD	PNM1264
	NSP	16	SYNCHRO SHAFT	PLA1131	NSP	66	MOTOR ASSY	PEA1320
		17	SPACER	PLA1133		67	MOTOR PULLEY	PNW1634
	NSP	18	LOADING BASE	PNB1532		68	MOTOR	PXM1002
	NSP	19	LEVER	PNB1486		69	SCREW	PBA1084
	NSP	20	SLIDE ANGLE	PNB1489		70	SCREW	PBA1087
C		21	.....		71	FLOAT SPRING	PBH1197	
		22	.....		72	FLOAT SPRING B	PBH1198	
		23	ROLLER	PNW2299	73	CONNECTOR ASS'Y (4P)	PDE1240	
		24	SYNCHRO GEAR	PNW2413	74	FLOAT RUBBER	PEB1267	
		25	ARM A	PNW2554	75	RUBBER BUSHING	VEB1138	
		26	ARM B	PNW2541	76	SCREW	BBZ26P060FZK	
		27	PULLEY	PNW2416	77	SCREW	BBZ30P050FZK	
		28	SELECT LEVER	PNW2417	78	SCREW	BBZ30P080FCC	
		29	DRIVE PLATE	PNW2549	79	SCREW	BPZ30P060FZK	
		30	CLAMPER	PNW2569	80	.....		
D	NSP	31	TENSIONER	PNW2423		81	SCREW	PMZ20P030FMC
		32	RACK	PNW2555		82	.....	
		33	SUB GEAR	PNW2425		83	WASHER	WT17D034D025
		34	A CUP	PNW2553		84	WASHER	WT21D050D025
		35	B CUP	PNW2427		85	WASHER	WT26D047D025
	NSP	36	D CUP	PNW2429		86	WASHER	WT26D047D050
		37	STOPPER	PNW2556		87	WASHER	WT36D072D025
		38	CLAMPER BASE	PNW2576		88	E RING	YE25FUC
		39	BUSHING	PNW2435	NSP	89	E RING	YE30FUC
	NSP	40	DISC GUIDE	PNW2550		90	SERVO MECHANISM ASS'Y B	PXA1539
D		41	ROLLER SHAFT	PLA1139	NSP	91	SERVO BASE	PNB1477
		42	ROLLER	DNK2391		92	SCREW	BPZ26P100FMC
		43	.....			93	BINDER	RNH-184
		44	BELT A	PEB1244		94	SHEET (S)	PED1022
		45	D CUP ASSY	PEA1329		95	DG SPACER	PNM1261
		46	SIDE ANGLE	PNB1533		96	SCREW	BCZ30P050FMC
		47	GEAR ANGLE	PNB1485				
		48	SLIDE LINK	PNB1490				
		49	.....					
		50	SCREW	PBA1099				

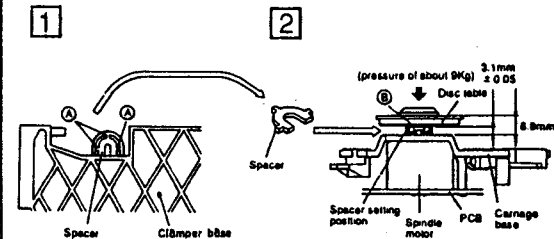




● EXTERIOR (2/2) (Servo Mechanism Assy B)



- How to install the disc table
- 1 Use nipper or other tool to cut the three sections marked (A) figure 1. Then remove the spacer.
  - 2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section (B)), and stick the disc table on top (takes about 9Kg pressure). Take off the spacer.



Parts List of Exterior (2/2)

Mark	No.	Description	Parts No.
A	96	GEAR 1 (POM)	PNW2052
	97	GEAR 2 (POM)	PNW2053
	98	GEAR 3 (POM)	PNW2054
	99	CARRIDGE BASE (FE)	PNW2445
	100	PICK UP ASS'Y	PEA1319
NSP	101	D.C. MOTOR ASSY (SPINDLE)	PEA1235
	102	D.C. MOTOR ASSY (CARRIAGE)	PEA1246
	103	PINION GEAR (POM)	PNW2055
	104	DC MOTOR	PXM1027
	105	DISC TABLE ASS'Y	PEA1314
NSP	106	MECHANISM BOARD ASSY	PWX1192
	107	GUIDE BAR (STEEL)	PLA1094
	108	SCREW	JFZ17P025FZK
	109	SCREW	JFZ20P040FMC
	110	SCREW	JFZ20P040FMC
B	111	WASHER	WT12D032D025
	112	CLAMP MAGNET	PMF1014
	113	YOKE M	PNB1312
	114	DISC TABLE	PNW2410

## 6. PCB PARTS LIST

### NOTES :

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "●" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 $\Omega$   $\rightarrow$  56  $\times$  10<sup>1</sup>  $\rightarrow$  561 ..... RD1/8PM 5 6 1 J

47k $\Omega$   $\rightarrow$  47  $\times$  10<sup>3</sup>  $\rightarrow$  473 ..... RD1/4PS 4 7 3 J

0.5 $\Omega$   $\rightarrow$  0R5 ..... RN2H 0 R 5 K

1 $\Omega$   $\rightarrow$  010 ..... RS1P 0 1 0 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k $\Omega$   $\rightarrow$  562  $\times$  10<sup>1</sup>  $\rightarrow$  5621 ..... RM1/4PC 5 6 2 1 F

Mark	No.	Description	Parts No.	Mark	No.	Description	Parts No.
<b>LIST OF ASSEMBLIES</b>							
$\Delta$		MOTHER BOARD ASSY	PWM1975		Q405	DIGITAL TRANSISTOR	DTC124EK
		— MAIN BOARD ASSY	PWZ3077		D391-397	DIODE	1SS133X
NSP		— OUTPUT BOARD ASSY	PWZ3080	<b>SWITCHES AND RELAYS</b>			
NSP		I/O CONNECTOR BOARD ASSY	PWX1390		S301	SWITCH	PSG1006
NSP $\Delta$		SUB BOARD ASSY	PWX1419	<b>COILS AND FILTERS</b>			
		— POWER BOARD ASSY	PWZ3065		L351	RADIAL INDUCTOR	LFA820K
NSP		— DISPLAY BOARD ASSY	PWZ3068	<b>CAPACITORS</b>			
NSP		— SWITCH BOARD ASSY	PWZ3070		C152, 153	ELECT. CAPACITOR	CEA3101M10
NSP		— ESCUTCHEON BOARD ASSY	PWZ3072		C155	CERAMIC CAPACITOR	CKSQYB182K50
NSP		— JOINT BOARD ASSY	PWZ3074		C156	CERAMIC CAPACITOR	CKSQYB333K25
					C157	CERAMIC CAPACITOR	CKSQYB103K50
					C158, 159	CERAMIC CAPACITOR	CKSQYB104K25
NSP		RACK BASE ASSY	PXA1572		C160	ELECT. CAPACITOR	CEA34R7M50
NSP		— RACK BOARD ASSY	PWX1340		C161	CERAMIC CAPACITOR	CKSQYB104K25
NSP		— RACK BOARD A ASSY	PWZ2779		C162	ELECT. CAPACITOR	CEA34R7M50
NSP		— RACK BOARD B ASSY	PWZ2781		C163	CERAMIC CAPACITOR	CKSQYB104K25
NSP		LOADING MECHANISM ASSY	PXA1571		C164, 167	CERAMIC CAPACITOR	CKSQYB103K50
NSP		— LOADING MECHANISM BOARD ASSY	PWX1422		C168	CERAMIC CAPACITOR	CKSQYB333K25
		— MECHA BOARD ASSY	PWZ2776		C169	CERAMIC CAPACITOR	CKSQYB103K50
NSP		— SENSOR BOARD ASSY	PWZ2777		C170	CERAMIC CAPACITOR	CKSQYB332K50
NSP		— LOADING BOARD ASSY	PWZ2778		C171, 172	CERAMIC CAPACITOR	CKSQYB472K50
NSP		— SELECT MOTOR BOARD ASSY	PWZ2782		C205	CERAMIC CAPACITOR	CKSQYB103K50
NSP		— LOADING MOTOR BOARD ASSY	PWZ2783		C208, 209	ELECT. CAPACITOR	CEA3330M16
					C210, 215	CERAMIC CAPACITOR	CKSQYB103K50
NSP		— SERVO MECHANISM ASSY B	PXA1539		C218, 219	CERAMIC CAPACITOR	CKSQYB103K50
NSP		— MECHANISM BOARD ASSY	PWX1192		C225, 230	CERAMIC CAPACITOR	CKSQYB103K50
					C301, 302	ELECT. CAPACITOR	CEA3330M16
<b>MAIN BOARD ASSY</b>					C303	CERAMIC CAPACITOR	CKSQYB104K25
<b>SEMICONDUCTORS</b>					C304, 305	CERAMIC CAPACITOR	CKSQYF104Z25
					C306	CERAMIC CAPACITOR	CKSQYB152K50
					C307	CERAMIC CAPACITOR	CKSQYB473K25
					C308	CERAMIC CAPACITOR	CKSQYB103K50
					C309	ELECT. CAPACITOR	CEA34R7M50
$\Delta$	IC151	SERVO IC	CXA1372Q		C351	ELECT. CAPACITOR	CEA3331M6R3
$\Delta$	IC201, 202	POWER OP-AMP IC	LA6520		C352, 353	CHIP CAPACITOR	CKSQYF103Z50
$\Delta$	IC203	POWER OP-AMP IC	LA6517		C354	CHIP CAPACITOR	CCSQYCH101J50
	IC301	EFM DEMODULATION IC	CXD2500BQ		C355, 361	CHIP CAPACITOR	CKSQYF103Z50
	IC351	MICROCOMPUTER, IC	PD3315A		C367	CHIP CAPACITOR	CKSQYF103Z50
	IC401	D/A CONVERTER IC	PD2026B(L)		C393	CHIP CAPACITOR	CCSQYCH101J50
	IC405	IC	NJM4558M		C401	ELECT. CAPACITOR	CEA3330M16
	Q322	DIGITAL TRANSISTOR	DTC124EK		C403	CHIP CAPACITOR	CCSQYCH120J50
	Q391	CHIP TRANSISTOR	2SC2412K		C404	CHIP CERAMIC C.	CCSQYCH220J50
	Q403, 404	TRANSISTOR	2SD2114K				

Mark	No.	Description	Parts No.
	C406, 410	CERAMIC CAPACITOR	CKSQYF104Z25
	C413	AUDIO FILM CAPACITOR	CFTYA104J50
	C414	CERAMIC CAPACITOR	CKSQYF104Z25
	C415, 416	AUDIO FILM CAPACITOR	CFTYA104J50
	C421	AUDIO FILM CAPACITOR	CFTYA104J50
	C423, 424	CERAMIC CAPACITOR	CKSQYF104Z25
	C429, 430	CHIP CAPACITOR	CCSQCH390J50
	C431, 432	ELECT. CAPACITOR	CEAS330M16
	C433, 434	ELECT. CAPACITOR	CEAS220M25
	C435-438	CHIP CAPACITOR	CCSQCH050C50
	C461	CHIP CAPACITOR	CKSQYF103Z50
	C71-74	ELECT. CAPACITOR	CEAS330M16
	C75-79	CERAMIC CAPACITOR	CKSQYF104Z25

RESISTORS

VR151, 152	VR(22k)	RCP1084
R439-442	CHIP METAL OXIDE RESISTOR	RN1/10SE104D
	OTHER RESISTORS	RS1/10S□□□□J

OTHERS

CN11	12PJUMPER CONNECTOR	52147-1210
CN201	JACK 6P	VKN-004
CN202	22P CONNECTOR	52044-2245
CN203	CONNECTOR 5P	173981-5
CN351	CONNECTOR 28P	9604S-28C
CN352	3P JUMPER CONNECTOR	52147-0310
CN353	9P JUMPER CONNECTOR	52147-0910
X351	CERAMIC RESONATOR	VSS1031
X401	XTAL RES (OSC)	PSS1008

OUTPUT BOARD ASSY

COILS AND FILTERS

L391	RADIAL INDUCTOR	LFA010K
L395, 396	RADIAL INDUCTOR	LFA010K

CAPACITORS

C388, 389	CERAMIC CAPACITOR	CKSQYB104K25
C397	CERAMIC CAPACITOR	CCCCH470J50
C398	CERAMIC CAPACITOR	OGCYX104K25
C399	CERAMIC CAPACITOR	CCCCH470J50
C441, 442	AUDIO FILM CAPACITOR	CFTXA152J50

OTHERS

JA391, 392	JACK	RKN1004
JA393	JACK	PKN1005
JA401	JACK	PKB1009

I/O CONNECTOR BOARD ASSY

SEMICONDUCTORS

D1301-1314	DIODE	1SS254
------------	-------	--------

CAPACITORS

C1301-1305	AXIAL CAPACITOR	CKPUYB101K50
C1306-1308	CERAMIC CAPACITOR	CKPUYF103Z25

RESISTORS

ALL RESISTORS	RD1/6PM□□□□J
---------------	--------------

OTHERS

JA394	CONNECTOR	PKP-038
-------	-----------	---------

Mark	No.	Description	Parts No.
------	-----	-------------	-----------

POWER BOARD ASSY

SEMICONDUCTORS

△ IC21	REGULATOR, IC	PQ05RR12
△ IC22	REGULATOR IC	NJM79L05A
△ D11-14	DIODE	11ES2
△ D52	DIODE	11ES2
D54	ZENNER DIODE	MTZJ18B/C

CAPACITORS

C11, 13	CERAMIC CAPACITOR	CKCYF103Z50
C15-17	CERAMIC CAPACITOR	CKCYF103Z50
C25	ELECT. CAPACITOR	CEAS472M16
C26	ELECT. CAPACITOR	CEAS102M16
C27	ELECT. CAPACITOR	CEAS471M6R3

C28	ELECT. CAPACITOR	CEAS101M10
C52	ELECT. CAPACITOR	CEAS101M35

RESISTORS

R22	CARBON FILM RESISTOR	RD1/6PM103J
R51	CARBON FILM RESISTOR	RD1/6PM103J
R52-54	CARBON FILM RESISTOR	RD1/6PM152J

TRANSFORMER

△	POWER TRANSFOMER	PTT1297
---	------------------	---------

OTHERS

△	TERMINAL	RKC-061
---	----------	---------

DISPLAY BOARD ASSY

SEMICONDUCTORS

D703, 704	DIODE	1SS254
-----------	-------	--------

SWITCHES AND RELAYS

S703, 707	SWITCH	PSG1006
S708, 711	SWITCH	PSG1006
S712, 715	SWITCH	PSG1006
S716	SWITCH	PSG1006

RESISTORS

R701-704	CARBON FILM RESISTOR	RD1/6PM103J
----------	----------------------	-------------

OTHERS

CN701	CONNECTOR 28P	9604S-28F
V701	FL TUBE	PEL1079

SWITCH BOARD ASSY

SEMICONDUCTORS

D701, 702	DIODE	1SS254
-----------	-------	--------

SWITCHES AND RELAYS

S701, 702	SWITCH	PSG1006
S709, 710	SWITCH	PSG1006
S713, 714	SWITCH	PSG1006

OTHERS

REMOTE SENSOR	SBX1785
---------------	---------

Mark	No.	Description	Parts No.
<b>ESCUTCHEON BOARD ASSY</b>			
<b>SEMICONDUCTORS</b>			
	D801	LED	SEL6210S-TS
<b>RESISTORS</b>			
	R801	CARBON FILM RESISTOR	RD1/6PM331J
<b>OTHERS</b>			
	CN801	3PJUMPER CONNECTOR	52151-0310
	J802	CONNECTOR ASS'Y	PDE1250
<b>JOINT BOARD ASSY</b>			
<b>OTHERS</b>			
	CN751, 752	CONNECTOR 28P	9604S-28F
<b>RACK BOARD A ASSY</b>			
<b>SWITCHES AND RELAYS</b>			
	S651, 652	PUSH SWITCH	DSG1015
<b>OTHERS</b>			
	CN651	CONNECTOR 5P	VKN1062
<b>RACK BOARD B ASSY</b>			
<b>SWITCHES AND RELAYS</b>			
	S653, 654	PUSH SWITCH	DSG1015
<b>MECHA BOARD ASSY</b>			
<b>OTHERS</b>			
	CN621	CONNECTOR	12FMZ-ABT
	CN622	CONNECTOR 3P	4-173979-3
	CN623	CONNECTOR 4P	173979-4
	CN624	CONNECTOR 3P	6-173979-3
	CN625	CONNECTOR 22P	SLEM22R-2
	CN626	CONNECTOR 3P	6-173979-4
	CN627	CONNECTOR 3P	173979-3
<b>SENSOR BOARD ASSY</b>			
<b>SEMICONDUCTORS</b>			
	Q631	PHOTO-INTERRUPTER	GP1A53HR
<b>SWITCHES AND RELAYS</b>			
	S631	PUSH SWITCH	DSG1016
<b>RESISTORS</b>			
	R631	CARBON FILM RESISTOR	RD1/6PM471J
<b>OTHERS</b>			
	CN631	CONNECTOR 3P	6-173979-4

Mark	No.	Description	Parts No.
<b>LOADING BOARD ASSY</b>			
<b>SWITCHES AND RELAYS</b>			
		REAF SWITCH	VSK1011
<b>OTHERS</b>			
	CN641	CONNECTOR 3P	4-173979-3
<b>SELECT MOTOR BOARD ASSY</b>			
<b>OTHERS</b>			
	J627	CONNECTOR ASS'Y 2P	PDE1244
<b>LOADING MOTOR BOARD ASSY</b>			
<b>OTHERS</b>			
	J624	CONNECTOR ASS'Y 2P	PDE1245
<b>MECHANISM BOARD ASSY</b>			
<b>SWITCHES AND RELAYS</b>			
	S610	PUSH SWITCH	DSG1016
<b>OTHERS</b>			
	CN610	CONNECTOR 4P	173979-4

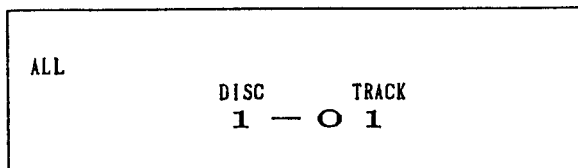
## 7. OPERATING DESCRIPTION

### 7.1 POWER SUPPLY RECEPTACLE ON

When the mechanism is not at the home position when the power supply receptacle is switched ON, it will return to the home position, the mechanism will be clamped and stop will be executed with the following display.

The normal play mode will be <ALL> mode when no mode specification has been made.

Receptacle ON (DISC Display)

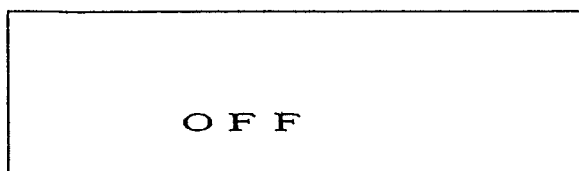


### 7.2 POWER ON/OFF (Product, Remote Control)

#### 1. POWER - OFF

1. When the <POWER ON/OFF> key is pressed at the time of POWER ON, the entire FL will go out, and power OFF condition will be reached.
2. Except for the <POWER ON/OFF> key, all other keys are disabled during POWER OFF.
3. When the <POWER ON/OFF> key is pressed during PLAY, during SEARCH, etc., the operation will be stopped, the disc will be stored, the mechanism will return to the home position, clamping will be executed, and then the power will be switched OFF. At this time, "OFF" is displayed at the 7-segment display to indicate that POWER-OFF is being executed.

During POWER-OFF



4. The play mode, the program, the customer, and the last disc are kept even when POWER OFF is executed.

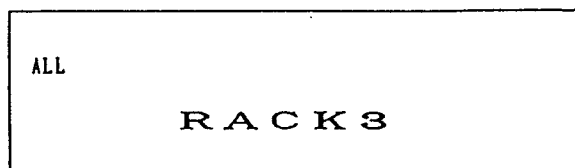
### 2. POWER-ON

1. When the <POWER ON/OFF> key is pressed at the time of POWER OFF, the FL will light, and all keys will be enabled.
2. The disc No. at the time of POWER OFF will be displayed, and when then the <PLAY> key is pressed, that disc will be searched and played. (Last Disc Memory specifications)
3. When the <TRACK-BACK> key is pressed within 1 sec. after POWER-ON, the business demonstration display will be started. When a key is pressed or the door is opened, the demonstration will stop, and the display returns to the original display mode.

### 7.3 DOOR AND ROLLING RACK OPEN

1. As play operation is continued even when the door is opened, disc exchange is possible even during playback, but as the rolling rack with the mechanism behind it can not be tilted, the discs in that rack can not be exchanged.
2. While the door is open, the number of the rolling rack which can not be tilted is displayed on the 7-segment display. (Only "RACK" is displayed when all racks can be tilted.)

With open door



(The number of the rack which can not be tilted is shown.)

3. When the door is opened during selection or loading the operation will be interrupted temporarily. The operation will be started again after confirmation that the door has been closed. Accordingly, when the <PLAY> key or the <RANDOM> key is pressed while the door and the rolling rack is open, play operation will not begin. Play will be started after confirmation that the door has been closed.
4. When a rolling rack is tilted, the disc existence information for that part, the program write information, and the random erasure information are cleared. (The customer writing information is not cleared.) When at this time all written information is cleared in <PROGRAM> mode, <ALL> mode will be entered.

## 7.4 PAUSE (Product, Remote Control)

1. When the <PAUSE> key is pressed during play, the PAUSE segment will light and pause will be executed at that location.  
When the <PAUSE> key is pressed during search, pause will be executed at the search completion address.
2. When skip title selection is executed in pause condition, pause will be executed at the search completion address.
3. Pause is cancelled with the <PAUSE> key or the <PLAY> key.

## 7.5 STOP (Last Disc Memory specification) (Product, Remote Control)

1. When the <STOP> key is pressed during play, the number of the disc played immediately before will be displayed, the disc will be stored, the mechanism will return to the home position, clamping will be executed and stop condition will be reached.
2. When the <PLAY> key is pressed again, the previously played disc will be searched and played (Last Disc Memory).  
When a program has been set up, the number of the first disc in the program will be displayed, and when then the <PLAY> key is pressed, play will start from that disc.

<STOP> key ON

ALL	DISC	TRACK
	2 5 - 0 1	

(The number of the disc played immediately before is shown.)

<STOP> key ON (with a program)

DISC	TRACK	PGM
7 - 0 1		

(The number of the first disc of the program is shown.)

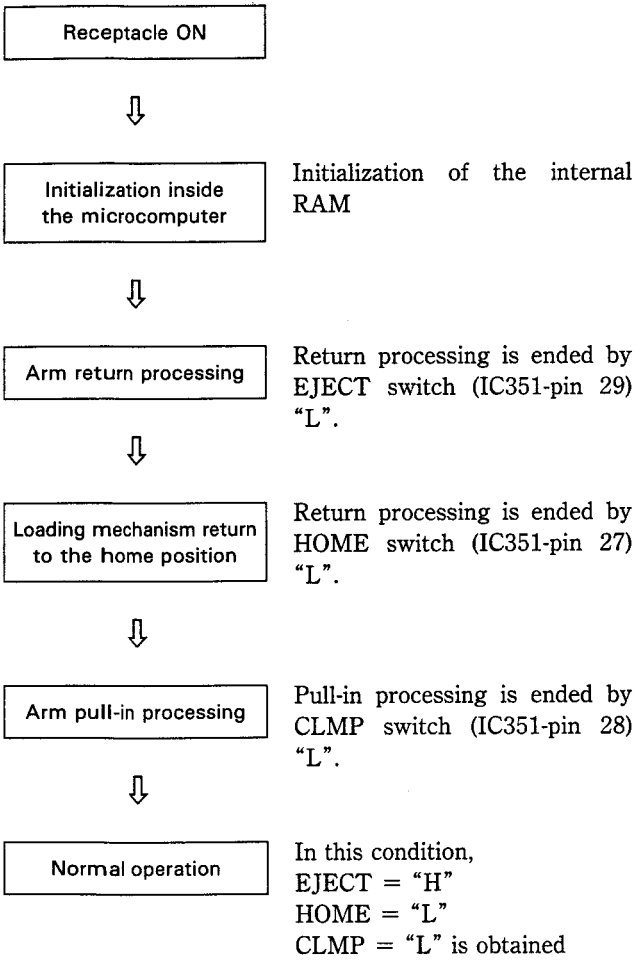
3. Last Disc Memory applies for all modes, <ALL>, <SINGLE>, and <CUSTOM>.  
(However, this applies only for normal play.)
4. When the <STOP> key is pressed during repeat or pause ON, repeat or pause also will be cancelled.  
When the <STOP> key is pressed during stop in <PROGRAM> mode, <PROGRAM> mode will be cancelled (when a program has been written, this also will be cleared), and <ALL> mode will be entered.

## 7.6 LIST OF FL DISPLAY CHARACTERS

Display	Contents
OFF	Displayed after the POWER key has been pressed until standby status has been reached.
RACK *	Displayed when the door or the rack is open. * shows the number of the rack where the mechanism is (number of the rack which can not be opened).
RACK	When no number is shown, the mechanism is at the home position. All racks can be opened.
25-no	Displayed when there has been no disc (Example: No 25th disc).
End	Displayed when manual search has been executed to the last disc.
PAUSE	Displayed when PAUSE PGM has been entered by PGM input.
P- **	Display of the entered PGM step when the TOTAL display has been set in PGM mode.
C1- **	Displayed at the time of confirmation of the disc entered in custom mode. (C1 at the time of custom 1 check)

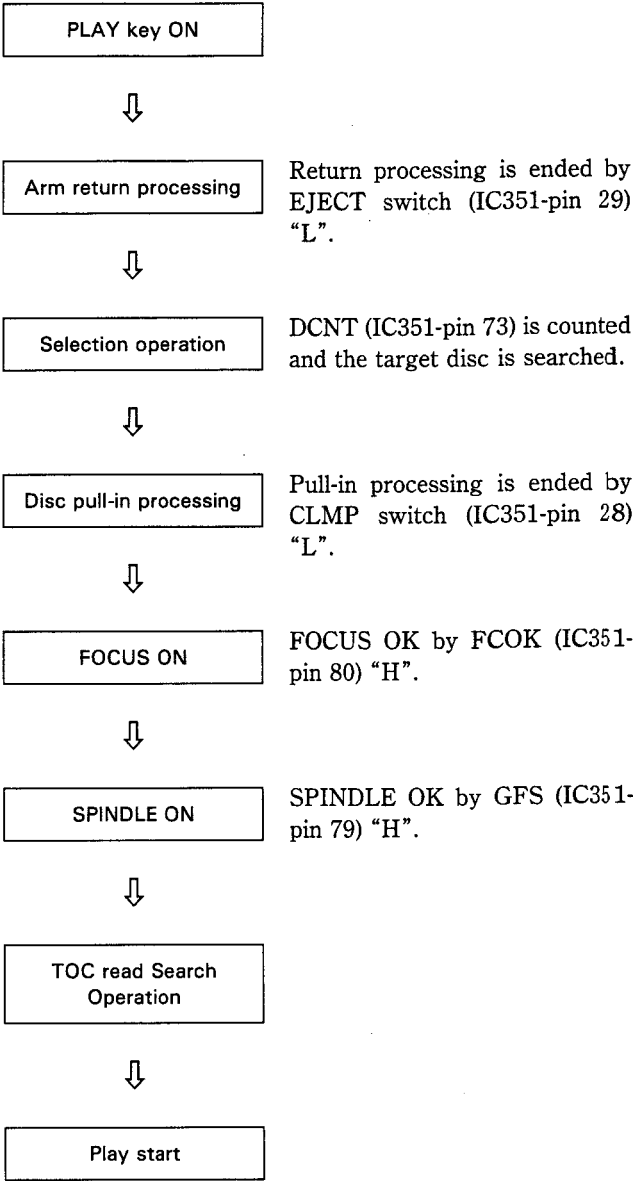
7.7 OPERATION FLOWCHART

1. Sequence at the time of Receptacle ON



Afterwards, selection and playing is executed by input of the PLAY key etc.  
In case of NG for an operation, stop is executed at the respective position if the operation is not completed after several retries.

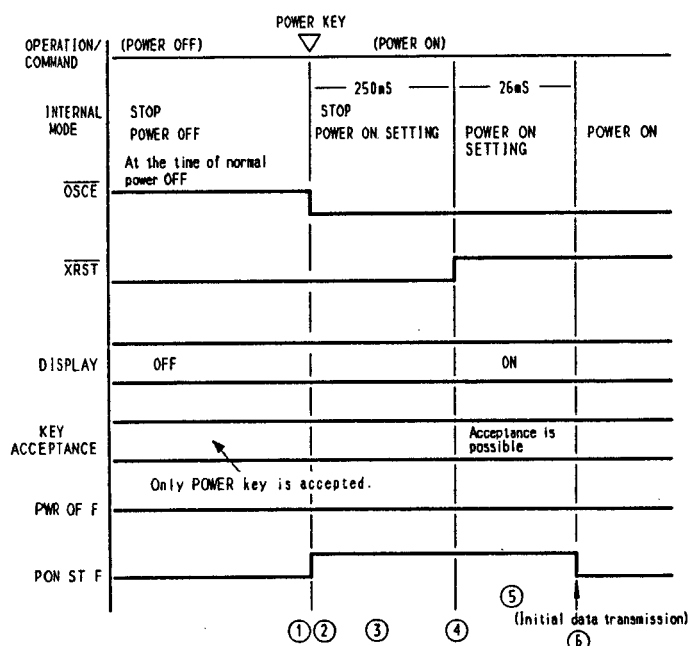
2. Sequence at the time of Setup  
(from Mechanism Home Position Standby)





### 3. Power ON/OFF Sequence

#### 1. OSCE, XRST timing and operation flags at the time of power OFF → power ON



- ①. Press the POWER key for power OFF.
- ②.  $\overline{\text{OSCE}} = \text{"L"}$  (LSI oscillation permission) occurs immediately.
- ③. Waiting for 250 ms.
- ④.  $\overline{\text{XRST}} = \text{"H"}$  (LSI reset cancellation)
- ⑤. Waiting for about 26 ms.
- ⑥. LSI initial setting is executed.

##### LSI DATA FOLLOW

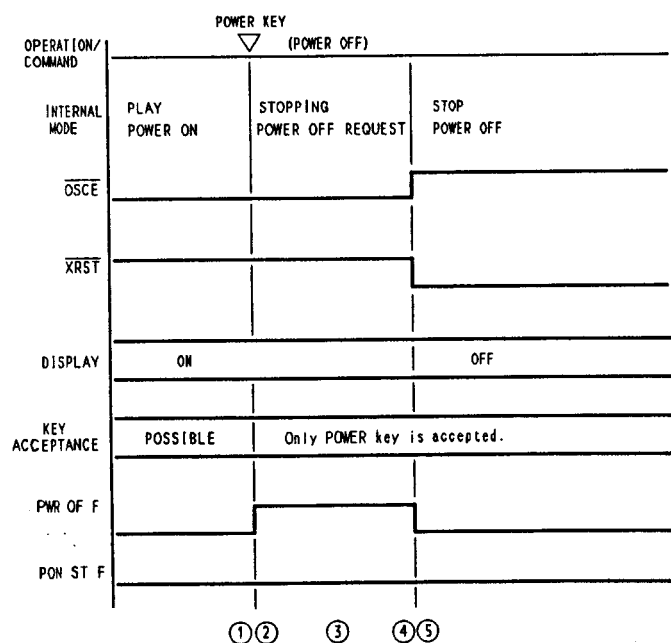
CLV - CNT INITIAL	\$D6
SERVO Coefficient Specification	\$C6
AUDIO CONTROL	\$A0
FUNCTION	\$9B20
MODE Specification	\$81

##### SERVO OFF

SP STOP	\$E0
BRKOFF	\$10
TR - OFF, SL - OFF	\$20
FOCUS - OFF	\$00
LD OFF	LDON = H

AUTO SEQUENCE OFF \$40

#### 2. OSCE, XRST timing and operation flags at the time of power ON → power OFF



- ①. Press the POWER key at the time of power ON.
- ②. Power OFF request flag = "H"  
If during play, the mechanism starts to stop.
- ③. The mechanism returns to the home position, waiting is executed until the end of operation.
- ④.  $\overline{\text{XRST}} = \text{"L"}$  (LSI reset) after stop completion.  
After 100  $\mu\text{s}$ ,  $\overline{\text{OSCE}} = \text{"H"}$  (LSI oscillation stop).
- ⑤. Power OFF request flag = "L"

##### Data flow at the time of power OFF

In order to prevent run-away of mechanism, LSI, etc. during power OFF, the output of each output port is initialized as follows. Direction follow also is executed.

LDON "H"

LOUT "L", LIN "L", DSRT "L", DSLT "L"

STBL "H", XLAT "H", DLAT "H", MUTE "H"

$\overline{\text{XRST}}$  "L", SYC3 "L", IN1 "L", OUT1 "L"

MUTB "L", SCLK "H", DATA "H", CLOK "H"

## 8. ADJUSTMENTS

### ■ Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

### ● Adjustment Items/Verification Items and Order

If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in steps 1–4, the pickup block may be defective.

Step	Item	Test Point	Adjustment Location
1	Focus offset verification	TP1, Pin6 (FCS. ERR)	None
2	Tracking error balance verification	TP1, Pin2 (TRK. ERR)	None
3	Pickup radial/tangential direction tilt adjustment	TP1, Pin1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
4	RF level verification	TP1, Pin1 (RF)	None
5	Focus servo loop gain adjustment	TP1, Pin5 (FCS. IN) TP1, Pin6 (FCS. ERR)	VR152 (FCS. GAN)
6	Tracking servo loop gain adjustment	TP1, Pin3 (TRK. IN) TP1, Pin2 (TRK. ERR)	VR151 (TRK. GAN)

### ● Abbreviation Table

FCS. ERR : Focus Error  
 TRK. ERR : Tracking Error  
 FCS. GAN : Focus Gain  
 TRK. GAN : Tracking Gain  
 FCS. IN : Focus In  
 TRK. IN : Tracking In

### ● Measuring Instruments and Tools

1. Dual trace oscilloscope (10 : 1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Low pass filter (39k $\Omega$  + 0.001 $\mu$ F)
5. Resistor (100k $\Omega$ )
6. 8cm disc (With at least about 20 minutes of recording)
7. Ball point hexagon wrench (GGK1002)
8. Standard tools

### ● Test Point and Adjustment Variable Resistor Positions

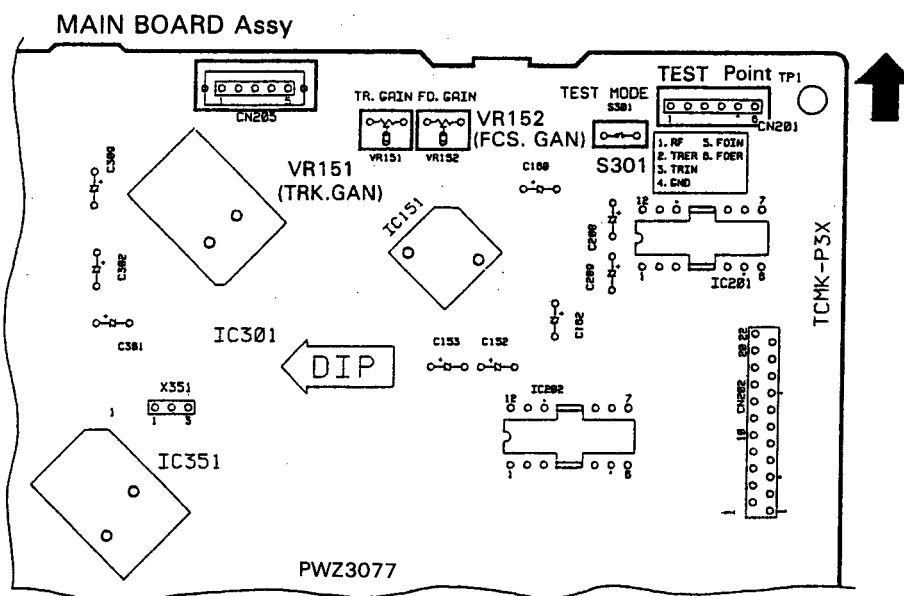


Fig. 1 Adjustment Location

### ● Notes

1. Use a 10 : 1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10 : 1 probe is used.

### ● Test Mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

#### [Setting these models to test mode]

How to set this model into test mode.

1. Unplug the power cord from the AC socket.
2. Push the test mode switch (S301). (See Fig. 1)
3. Plug the power cord back into the AC socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1–3.

[Release from test mode]

- Here is the procedure for releasing the test mode:
- 1. Press the STOP key and stop all operations.
  - 2. Unplug the power cord from the AC socket.

[Operations of the keys in test mode]

Code	Key Name	Function in Test Mode	Explanation
	MODE	Closes focus servo after the disc is clamped.	<p>After the first disc is clamped, the laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc.</p> <p>With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo.</p> <p>If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised three times and returned to its original position.</p>
▶	PLAY	Spindle servo ON	<p>Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500rpm at the inner periphery), sets the spindle servo in a closed loop.</p> <p>Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed.</p> <p>If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.</p>
⏸	PAUSE	Tracking servo close/open	<p>Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal.</p> <p>If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem.</p> <p>This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.</p>

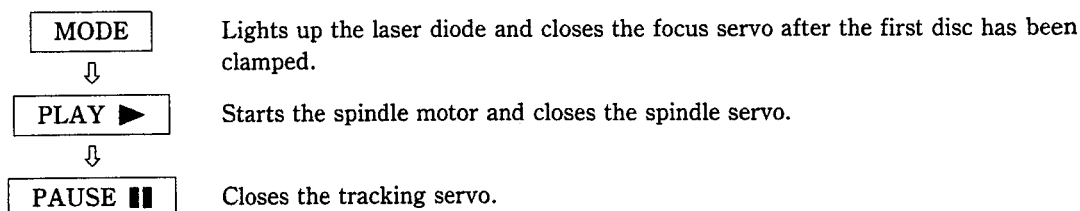
Code	Key Name	Function in Test Mode	Explanation
◀◀ • ◀◀	TRACK/ MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
▶▶ • ▶▶	TRACK/ MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
■	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed. After this, return the disc to the rack and the mechanism back to its original position.

*Note: Use the first disc in the test mode. (Other discs cannot be selected.)*

#### [How to playback a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.

Here is the key operation sequence for playing back a disc in test mode.



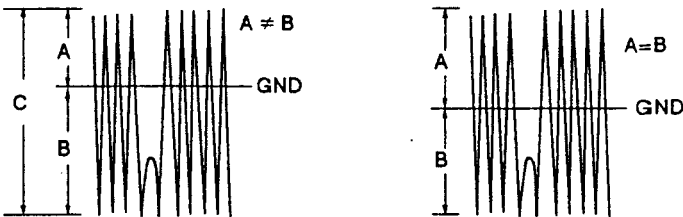
Wait at least 2–3 seconds between each of these operations.

## 1. Focus Offset Verification

● Objective	Verify the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement Instrument Connections	Connect the oscilloscope to TP1, Pin6 (FCS. ERR)	● Player State	Test mode, stopped (just the Power switch on)
	[Settings] 5mV/division 10ms/division DC mode	● Adjustment Location ● Disc	None None needed
<b>[Procedure]</b> Verify the DC voltage at TP1, Pin6 (FCS. ERR) is $0 \pm 50\text{mV}$ .			

*Note: If the specified values cannot be obtained or no adjustment is possible by performing the verifications or adjustments described in adjustment items 1–4, the pickup block may be defective.*

## 2. Tracking Error Balance Verification

● Objective	To verify that there is no variation in the sensitivity of the tracking photo diode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement Instrument Connections	Connect the oscilloscope to TP1, Pin2 (TRK. ERR). This connection may be via a low pass filter.	● Player State	Test mode, focus and spindle servos closed and tracking servo open.
	[Settings] 50mV/division 5ms/division DC mode	● Adjustment Location ● Disc	None YEDS-7
<b>[Procedure]</b> 1. Move the pickup to midway across the disc (R=35mm) with the TRACK/MANUAL SEARCH FWD ►►► key or REV ◄◄◄ key. 2. Press the MODE key, then the PLAY ► key in that order to close the focus servo then the spindle servo. 3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode. 4. Supposing that the positive amplitude of the tracking error signal at TP1, pin2 (TRK. ERR) is (A) and the negative amplitude is (B), the following expression is satisfied.			
When $A \geq B$ , $\frac{A-B}{C} \times \frac{1}{2} \leq 0.1$ When $A < B$ , $\frac{B-A}{C} \times \frac{1}{2} \leq 0.1$		 <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> <p>When there is a DC component</p> </div> <div style="text-align: center;"> <p>When there is no DC component</p> </div> </div>	

### 3. Pickup Radial/Tangential Tilt Adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement Instrument Connections	Connect the oscilloscope to TP1, Pin1 (RF).  [Settings] 20mV/division 200ns/division AC mode	● Player State  ● Adjustment Location  ● Disc	Test mode, play  Pickup radial tilt adjustment screw and tangential tilt adjustment screw  8 cm disc [However, those with approx. 20 min of audio signal (music).]

#### [Procedure]

1. Press the TRACK/MANUAL SEARCH FWD ►► • ►► key or REV ◄◄ • ◄◄ key to move the pickup to the external circumference of the disc.  
Press the MODE key, the PLAY ► key, then the PAUSE || key in that order to close the respective servos and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with the hexagon wrench (GGK1002) so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with the hexagon wrench (GGK1002) so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Fig. 3).  
※ The ball-point type hexagonal wrench is used because the disc will get in the way if a normal hexagonal wrench is used.
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.
5. When the adjustment is completed, lock the radial and tangential adjustment screw.

*Note: Radial and tangential mean the directions relative to the disc shown in Fig. 2.*

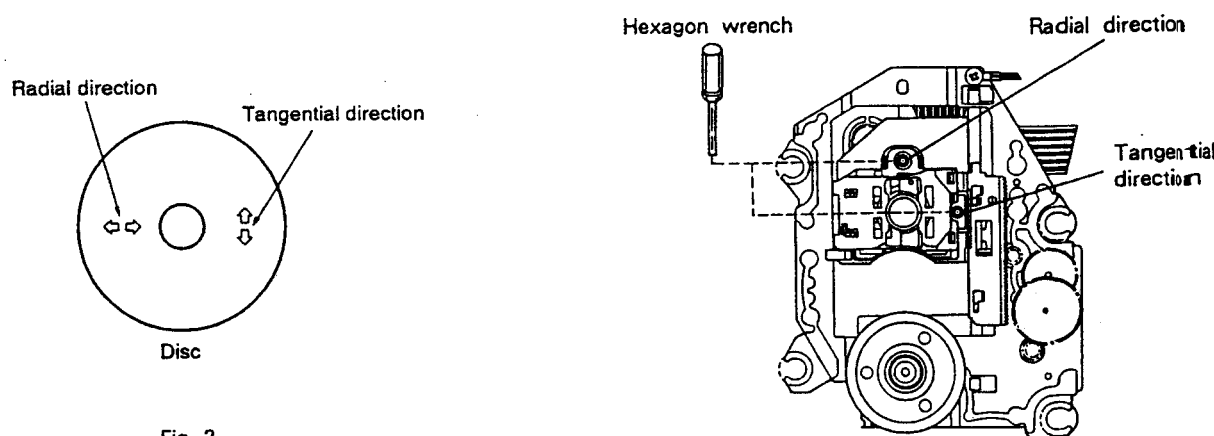


Fig. 2

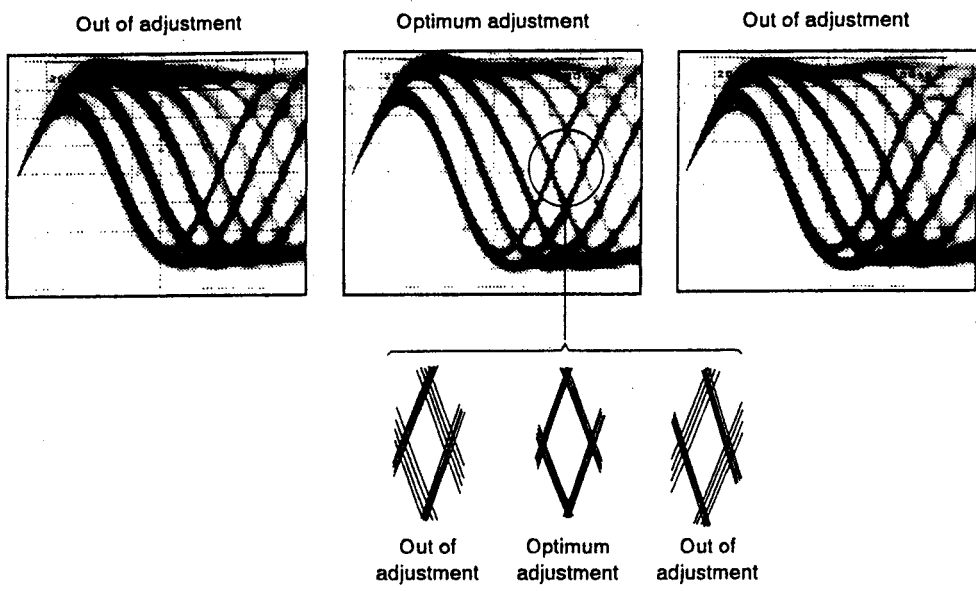


Fig. 3 Eye Pattern

4. RF Level Verification

● Objective	To verify the playback RF signal amplitude.		
● Symptom when out of adjustment	No play or no search		
● Measurement Instrument Connections	Connect the oscilloscope to TP1, Pin1 (RF).  [Settings] 50mV/division 10ms/division AC mode	● Player State  ● Adjustment Location  ● Disc	Test mode, play  None  YEDS-7
<p>[Procedure]</p> <p>1. Move the pickup to midway across the disc (R=35mm) with the TRACK/MANUAL SEARCH FWD ►►•►►  key or REV ◀◀◀•◀◀◀ key, then press the MODE key, the PLAY ► key, then the PAUSE    key in that order to close the respective servos and put the player into play mode.</p> <p>2. Verify the RF signal amplitude is 1.2Vp-p±0.2V.</p>			



### 5. Focus Servo Loop Gain Adjustment

● Objective	To optimize the focus servo loop gain.		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy.		
● Measurement Instrument Connections	See Fig. 4.	● Player State	Test mode, play
	[Settings] CH1 20mV/division X-Y mode CH2 5mV/division	● Adjustment Location  ● Disc	VR152 (FCS. GAN)  YEDS-7

- [Procedure]
- Set the AF generator output to 1.2kHz and 1Vp-p.
  - Press the TRACK/MANUAL SEARCH FWD ►►► key or REV ◄◄◄ key to move the pickup to halfway across the disc (R=35mm), then press the MODE key, the PLAY ► key, then the PAUSE ■■ key in that order to close the corresponding servos and put the player into play mode.
  - Adjust VR152 (FCS. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

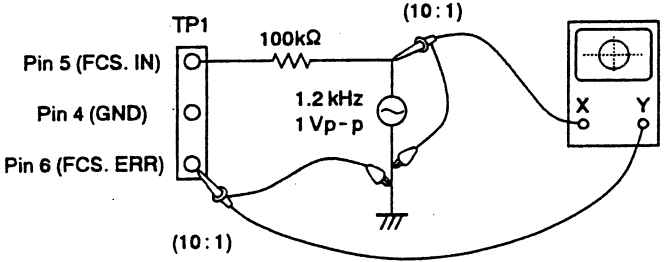
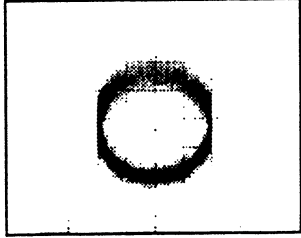


Fig. 4

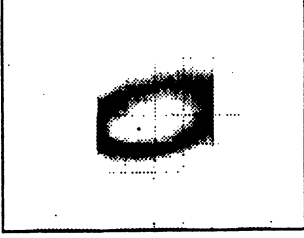
Focus Gain Adjustment



Higher gain



Optimum gain



Lower gain

### 6. Tracking Servo Loop Gain Adjustment

● Objective	To optimize the tracking servo loop gain.		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement Instrument Connections	See Fig. 5.	● Player State	Test mode, play
	[Settings] CH1 50mV/division X-Y mode CH2 20mV/division	● Adjustment Location  ● Disc	VR151 (TRK. GAN)  YEDS-7

- [Procedure]
- Set the AF generator output to 1.2kHz and 2Vp-p.
  - Press the TRACK/MANUAL SEARCH FWD ►►► key or REV ◄◄◄ key to move the pickup to halfway across the disc (R=35mm), then press the MODE key, the PLAY ► key, then the PAUSE ■■ key in that order to close the corresponding servos and put the player into play mode.
  - Adjust VR151 (TRK. GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

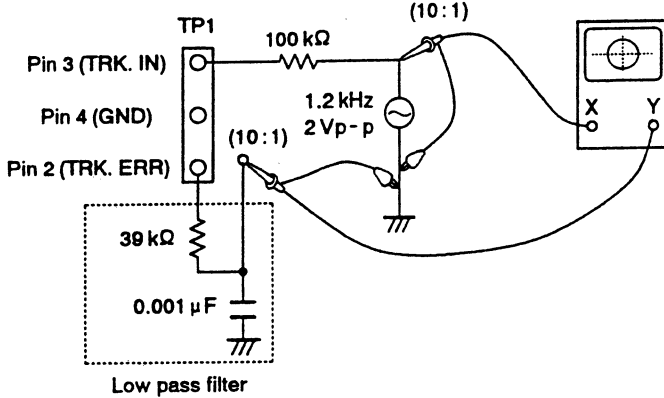
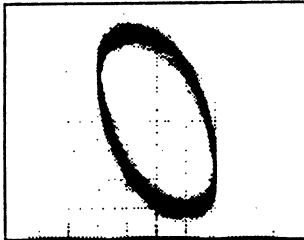
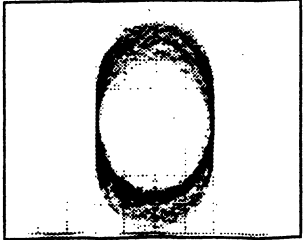


Fig. 5

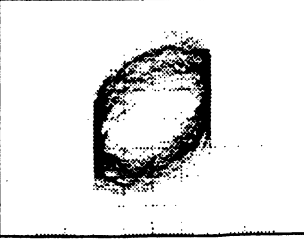
Tracking Gain Adjustment



Higher gain



Optimum gain



Lower gain

9. SCHEMATIC AND PCB CONNECTION DIAGRAMS

9.1 MECHA BOARD ASSY, SENSOR BOARD ASSY, LOADING BOARD ASSY, SELECT MOTOR BOARD ASSY, LOADING MOTOR BOARD ASSY AND MECHANISM BOARD ASSY

A NOTE FOR SCHEMATIC DIAGRAMS (Type 4A)

1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".

2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.

3. RESISTORS:  
Unit: k: k $\Omega$ , M: M $\Omega$ , or  $\Omega$  unless otherwise noted.  
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.  
Tolerance: (F):  $\pm 1\%$ , (G):  $\pm 2\%$ , (K):  $\pm 10\%$ , (M):  $\pm 20\%$  or  $\pm 5\%$  unless otherwise noted.

4. CAPACITORS:  
Unit: p: pF or  $\mu$ F unless otherwise noted.  
Ratings: capacitor ( $\mu$ F)/ voltage (V) unless otherwise noted.  
Rated voltage: 50V except for electrolytic capacitors.

5. COILS:  
Unit: m: mH or  $\mu$ H unless otherwise noted.

6. VOLTAGE AND CURRENT:  
or - V : DC voltage (V) in PLAY mode unless otherwise noted.  
or - mA : DC current in PLAY mode unless otherwise noted.  
Value in ( ) is DC current in STOP mode.

7. OTHERS:  
•  $\odot$  or  $\odot$  : Adjusting point.  
• \* : Measurement point.  
• The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. SCH- $\square$  ON THE SCHEMATIC DIAGRAM:  
• SCH- $\square$  indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

9. SWITCHES (Underline indicates switch position):

MECHANISM BOARD ASSY  
S610 INSIDE SW

MAIN BOARD ASSY  
S301 TEST MODE

DISPLAY BOARD ASSY  
S703  $\lll$   
S707 PAUSE  
S708 DISC NUMBER -  
S711  $\ggg$   
S712 STOP  
S715 PLAY  
S716 DISC NUMBER +

SWITCH BOARD ASSY  
S701 RANDOM  
S702 POWER  
S709 MODE  
S710 CLEAR  
S713 ADLC  
S714 TIME

SENSOR BOARD ASSY  
S631 HOME

RACK BOARD A ASSY  
S651 EJECT  
S652 EJECT

RACK BOARD B ASSY  
S653 EJECT  
S654 EJECT

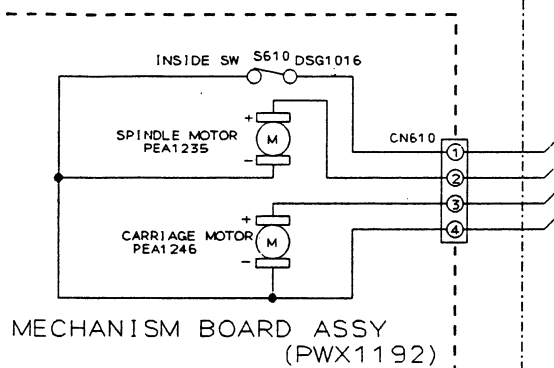
LOADING MECHANISM ASSY (PXA1571)

LOADING MECHANISM BOARD ASSY (PWX1422)

SELECT MOTOR BOARD ASSY (PWZ2782)

LOADING MOTOR BOARD ASSY (PWZ2783)

SERVO MECHANISM ASSY B (PXA1539)

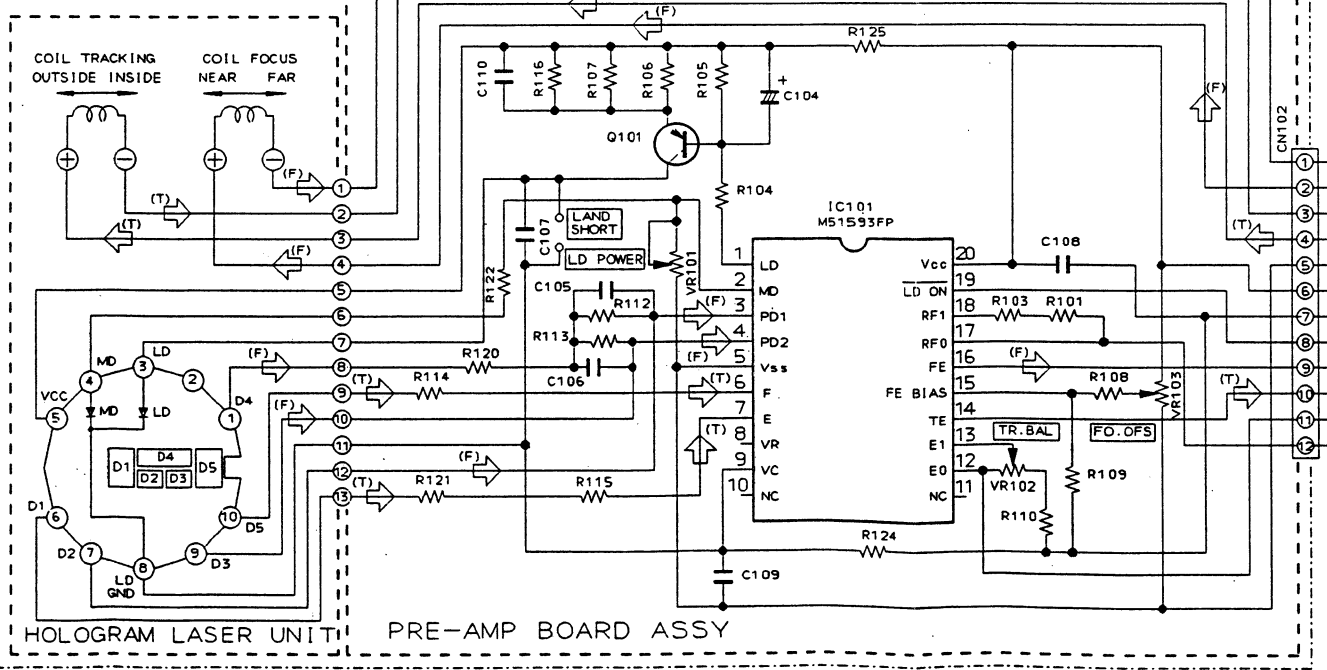


LOADING BOARD ASSY (PWZ2778)

SENSOR BOARD ASSY (PWZ2777)

MECHA BOARD ASSY (PWZ2776)

PICKUP ASSY (PEA1319)



SIGNAL ROUTE  
 $\leftarrow$  (F) : FOCUS SERVO LOOP LINE  
 $\leftarrow$  (T) : TRACKING SERVO LOOP LINE

SCH-1

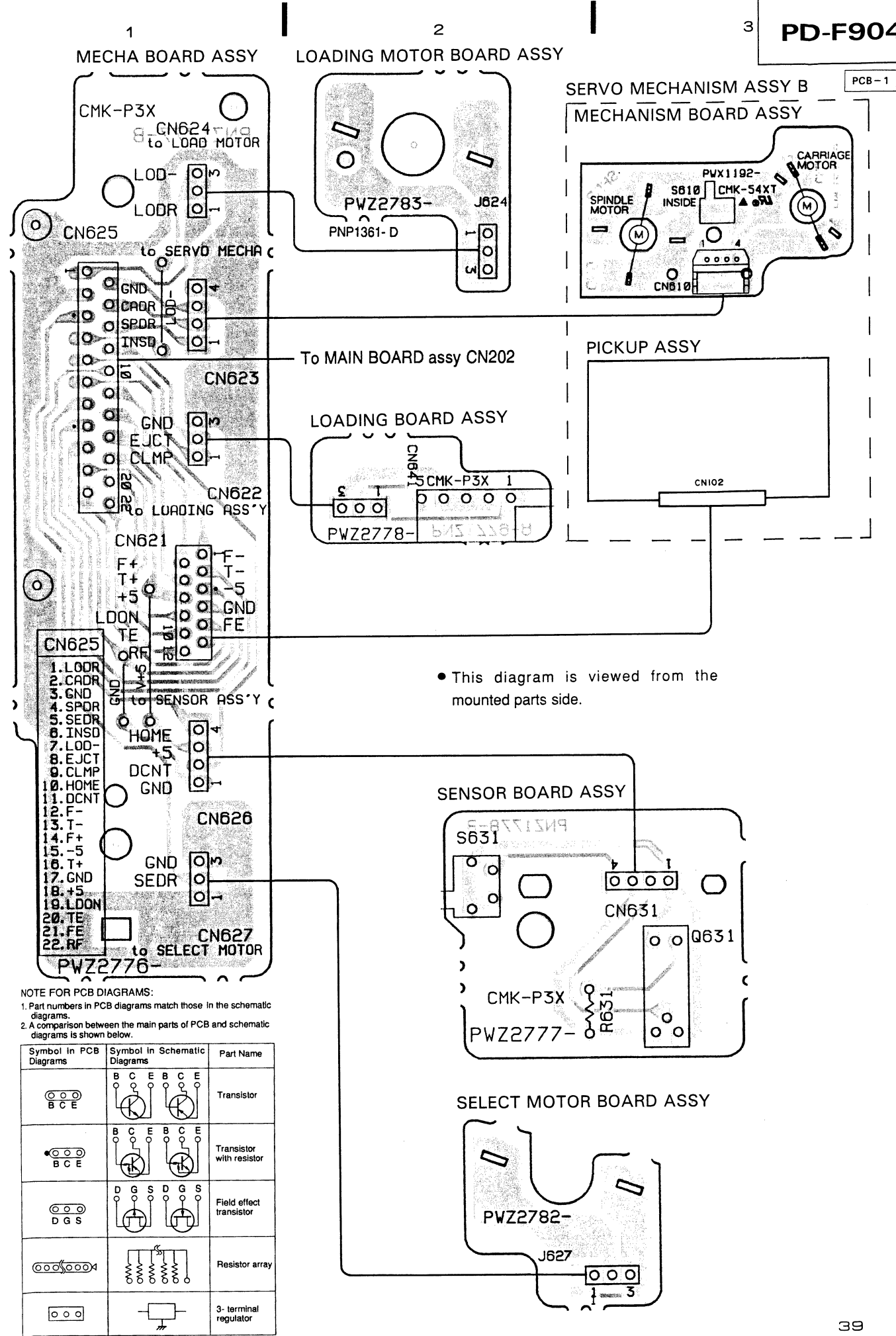
To MAIN BOARD ASSY CN202 (SCH-2)

MECHA BOARD ASSY, SENSOR BOARD ASSY,  
LOADING BOARD ASSY, SELECT MOTOR BOARD  
ASSY, LOADING MOTOR BOARD ASSY,  
MECHANISM BOARD ASSY

MECHA BOARD ASSY, SENSOR BOARD ASSY,  
LOADING BOARD ASSY, SELECT MOTOR BOARD  
ASSY, LOADING MOTOR BOARD ASSY,  
MECHANISM BOARD ASSY

SCH-1

SCH-1

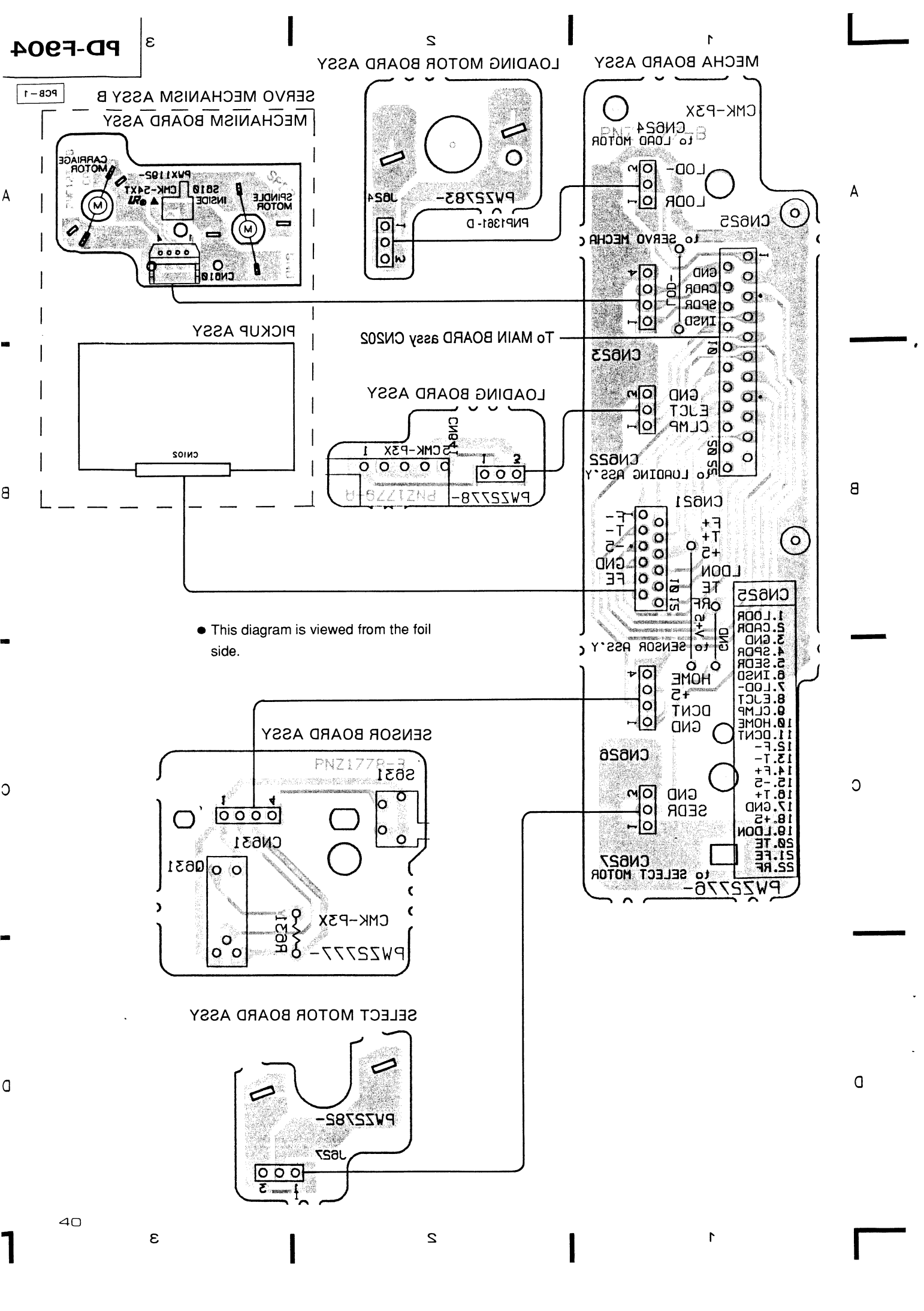


NOTE FOR PCB DIAGRAMS:

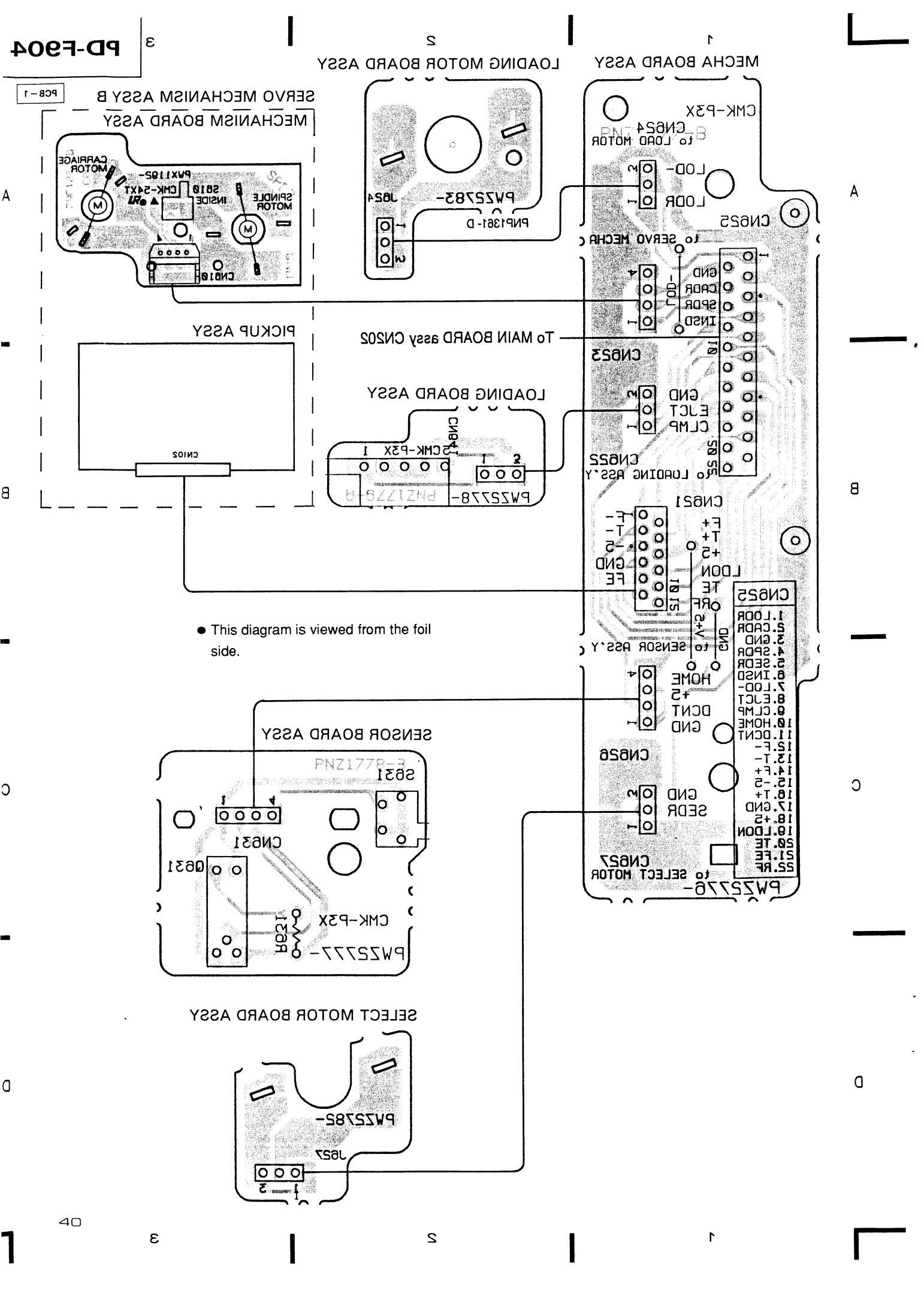
1. Part numbers in PCB diagrams match those in the schematic diagrams.

2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator



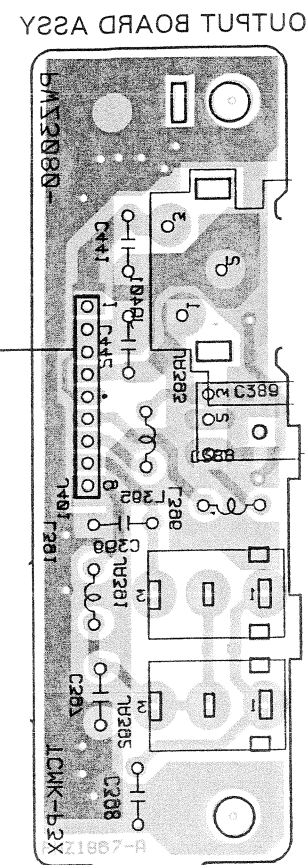
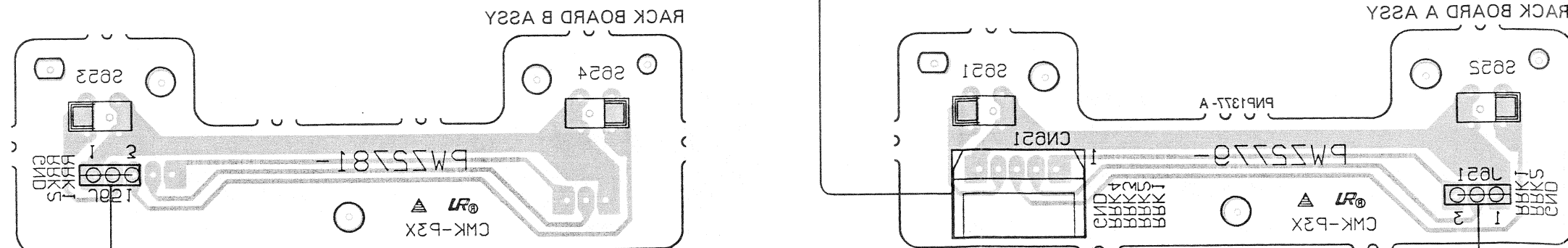
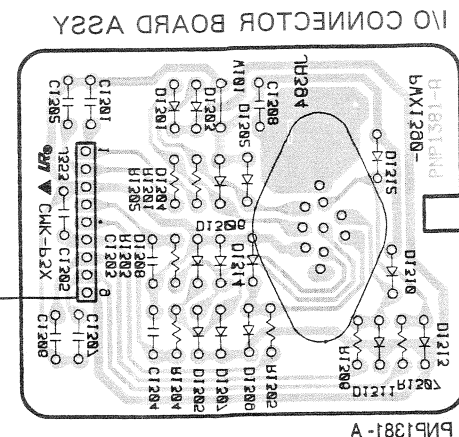
● This diagram is viewed from the foil side.



● This diagram is viewed from the foil side.

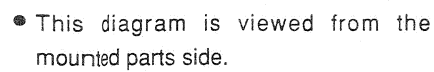


- This diagram is viewed from the gray colored foil side.
- This PCB is double side.





- This diagram is viewed from the pink colored foil side.
- This PCB is double sided.

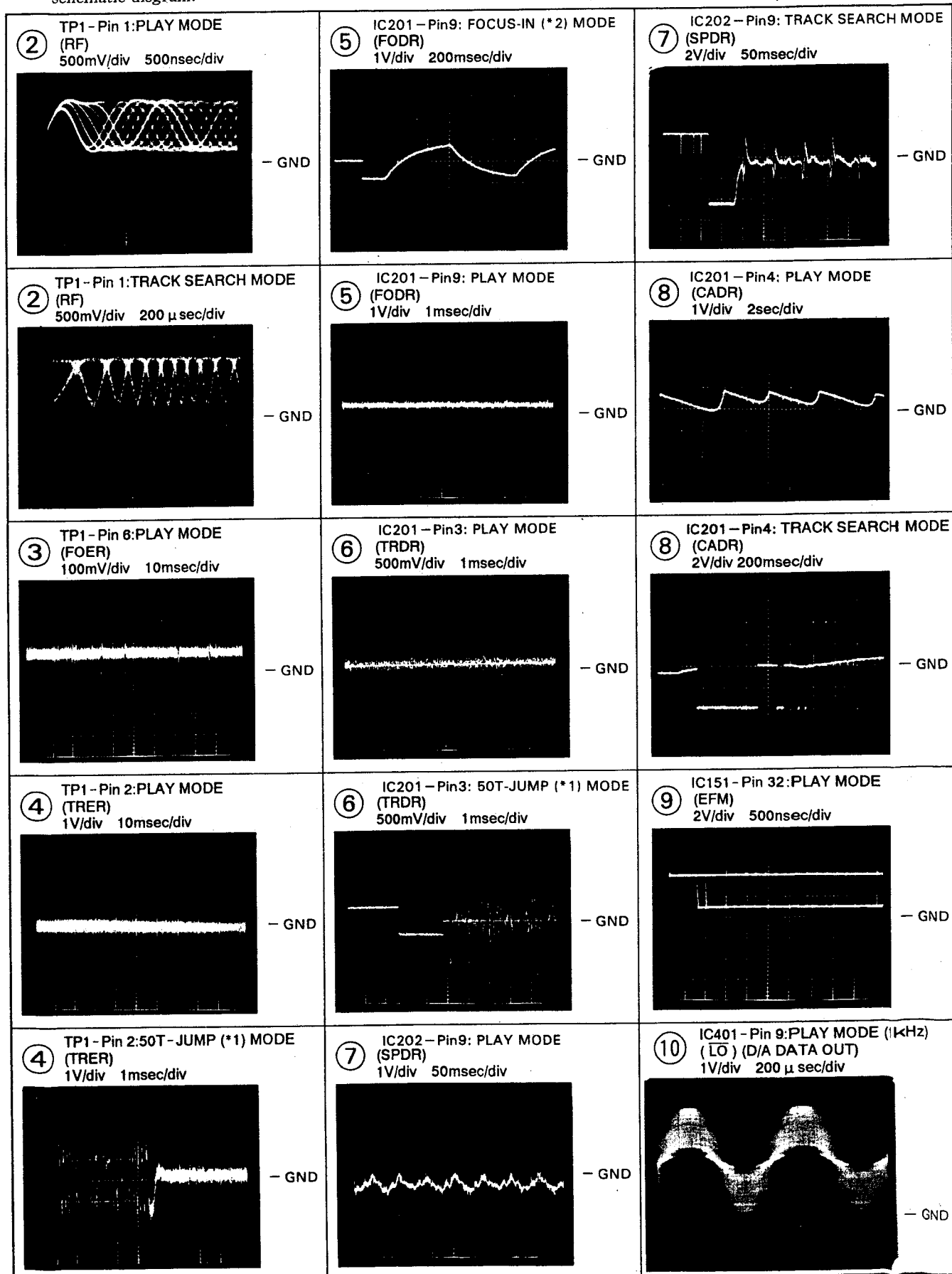


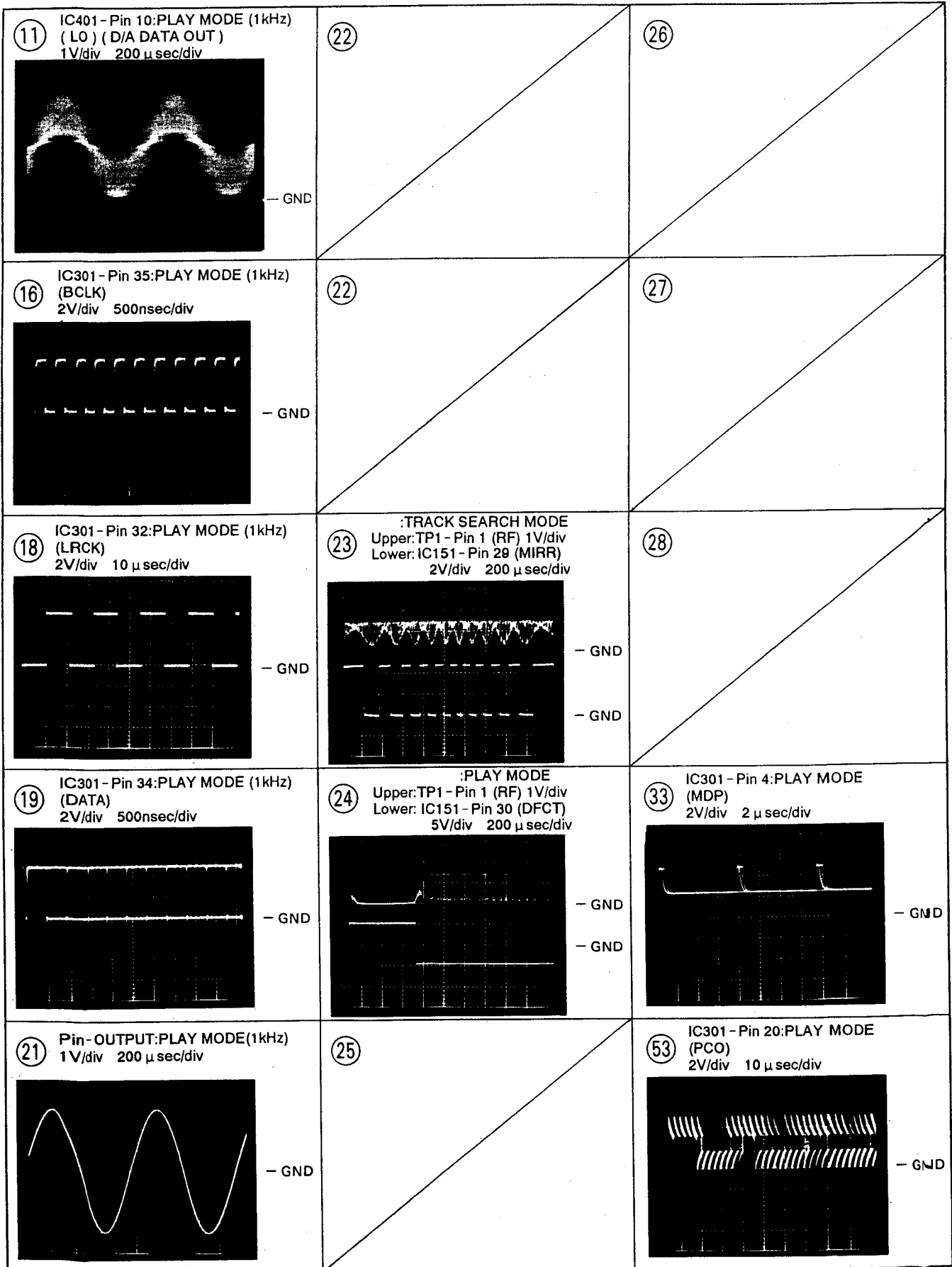
## Waveforms

Note: The encircled numbers denote measuring point in the schematic diagram.

\*1 50T-JUMP: After switching to the pause mode, press the manual search key.

\*2 FOCUS-IN: Press the key without loading a disc.







● IC401  
[PD2026B (L)]

Pin No.	Voltage[V]
1	0
2	0
3	5
4	5
5	2. 4
6	2. 6
7	0
8	0
9	2. 6
10	2. 4
11	5
12	0
13	2. 4
14	2. 4
15	5
16	0
17	5
18	0
19	2
20	5
21	5
22	5
23	5
24	5
25	2. 4
26	2. 4
27	2. 4
28	5

● IC301  
(CXD2500BQ)

Pin No.	Voltage[V]	Pin No.	Voltage[V]	Pin No.	Voltage[V]
1	5	31	1.3-2.2	61	0
2	2. 1	32	2. 5	62	2. 5
3	5	33	5	63	0
4	2. 6	34	2. 5	64	0
5	2. 2	35	2. 5	65	0
6	5	36	2. 5	66	3.3-4.8
7	0	37	2. 5	67	5
8	5	38	2. 5	68	0
9	0	39	0	69	2.1-3
10	0	40	5	70	5
11	2. 1	41	2. 5	71	5
12	0	42	5	72	5
13	1	43	2. 5	73	5
14	0.9-1.3	44	0	74	5
15	0	45	5	75	5
16	2	46	4. 4	76	0
17	0	47	0	77	5
18	2. 5	48	0	78	5
19	2. 4	49	0-0.3	79	5
20	2. 4	50	1. 2	80	0
21	0	51	1. 2		
22	2. 5	52	0		
23	5	53	2. 5		
24	2. 5	54	2. 5		
25	0. 2	55	0		
26	0	56	2. 9		
27	2. 5	57	2. 5		
28	0	58	2. 5		
29	0	59	0		
30	0	60	0		

● IC201 (LA6520)

Pin No.	Voltage[V]
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0. 1
12	8. 4
FIN	-8. 2

● IC202 (LA6520)

Pin No.	Voltage[V]
1	0
2	0
3	0
4	0
5	0
6	0
7	1. 7
8	1. 7
9	0.5-0.8
10	0
11	0. 1
12	8. 4
FIN	-8. 2

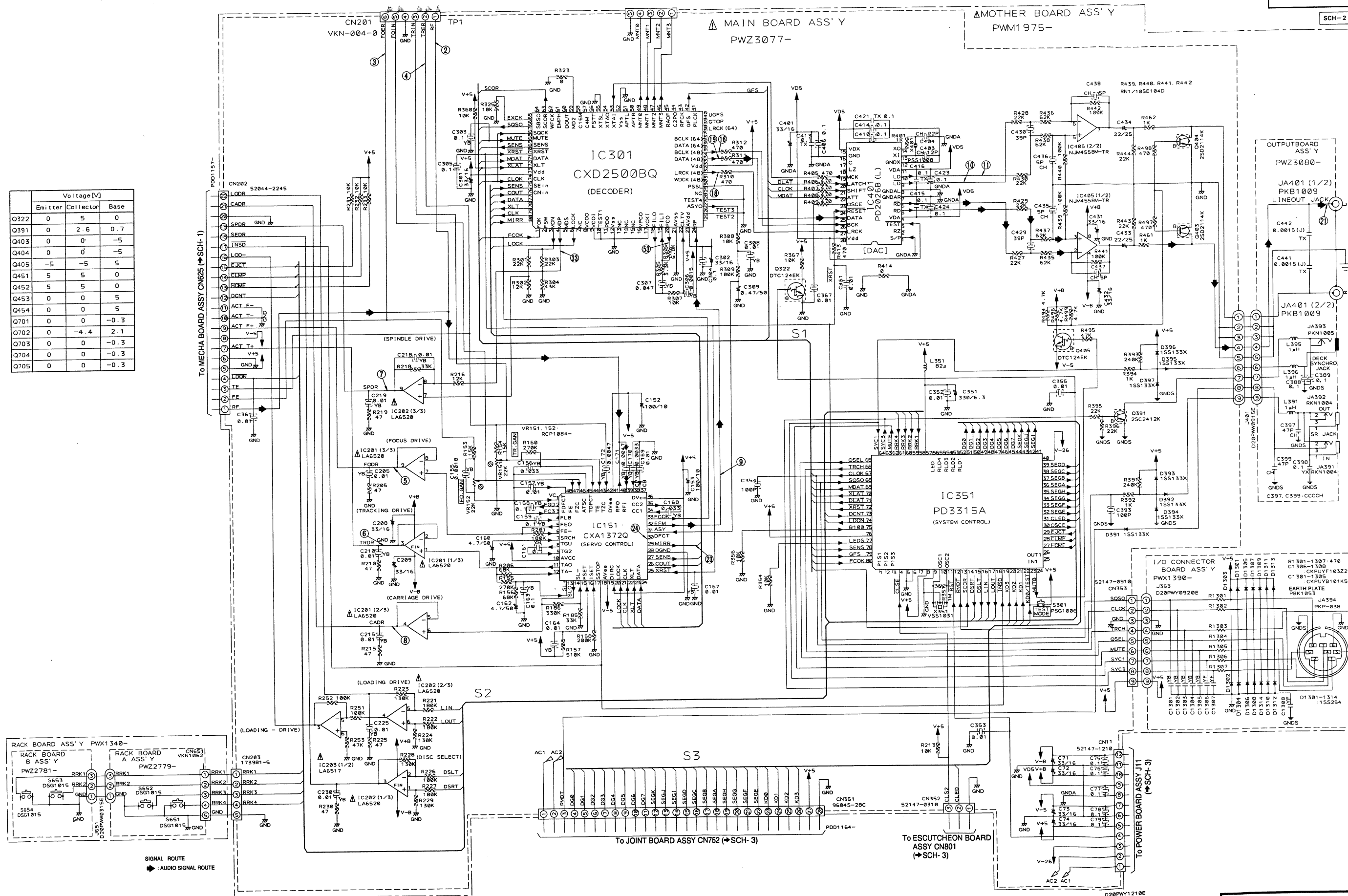
● IC151  
(CXA1372Q)

Pin No.	Voltage[V]	Pin No.	Voltage[V]
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	-0.3	29	0
6	0	30	-5
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	-1.5
11	0	35	-1.7
12	0	36	5
13	0	37	-0.7
14	0-0.3	38	-1.5
15	0	39	0
16	-4	40	0.8
17	1.3	41	-5
18	0	42	0
19	-5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0

● IC351  
(PD3315A)

Pin No.	Voltage[V]	Pin No.	Voltage[V]	Pin No.	Voltage[V]	Pin No.	Voltage[V]
1	5	21	0	41	-25.7	61	5
2	5	22	0	42	-25.7	62	0
3	5	23	0	43	-25.7	63	5
4	0	24	5	44	-25.7	64	5
5	0	25	5	45	-25.7	65	5
6	0	26	5	46	-25.7	66	0
7	0	27	5	47	-25.7	67	5
8	5	28	0	48	-25.7	68	5
9	0	29	5	49	-25.7	69	5
10	2.3	30	0	50	-25.7	70	5
11	2.3	31	5	51	-25.7	71	5
12	5	32	-25.7	52	5	72	5
13	5	33	-25.7	53	-0.9	73	5
14	0	34	-25.7	54	-0.9	74	0
15	0	35	-25.7	55	-0.9	75	0
16	0	36	-25.7	56	-0.9	76	5
17	0	37	-25.7	57	5	77	0
18	0	38	-25.7	58	5	78	0
19	5	39	-25.7	59	5	79	5
20	0	40	-25.7	60	5	80	5

	Voltage [V]		
	Emitter	Collector	Base
Q322	0	5	0
Q391	0	2.6	0.7
Q403	0	0	-5
Q404	0	0	-5
Q405	-5	-5	5
Q451	5	5	0
Q452	5	5	0
Q453	0	0	5
Q454	0	0	5
Q701	0	0	-0.3
Q702	0	-4.4	2.1
Q703	0	0	-0.3
Q704	0	0	-0.3
Q705	0	0	-0.3



**SCH-2**

MAIN BOARD ASSY, OUTPUT BOARD ASSY,  
RACK BOARD A ASSY, RACK BOARD B ASSY,  
I/O CONNECTOR BOARD ASSY

MAIN BOARD ASSY, OUTPUT BOARD ASSY,  
RACK BOARD A ASSY, RACK BOARD B ASSY,  
I/O CONNECTOR BOARD ASSY

**SCH-2**

(3). POWER BOARD ASSY, DISPLAY BOARD ASSY, SWITCH BOARD ASSY, ESCUTCHEON BOARD ASSY AND JOINT BOARD ASSY

A

B

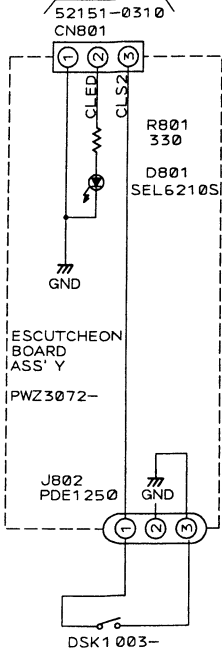
C

D

6

SCH-3

To MAIN BOARD ASSY CN352  
(→SCH-2)



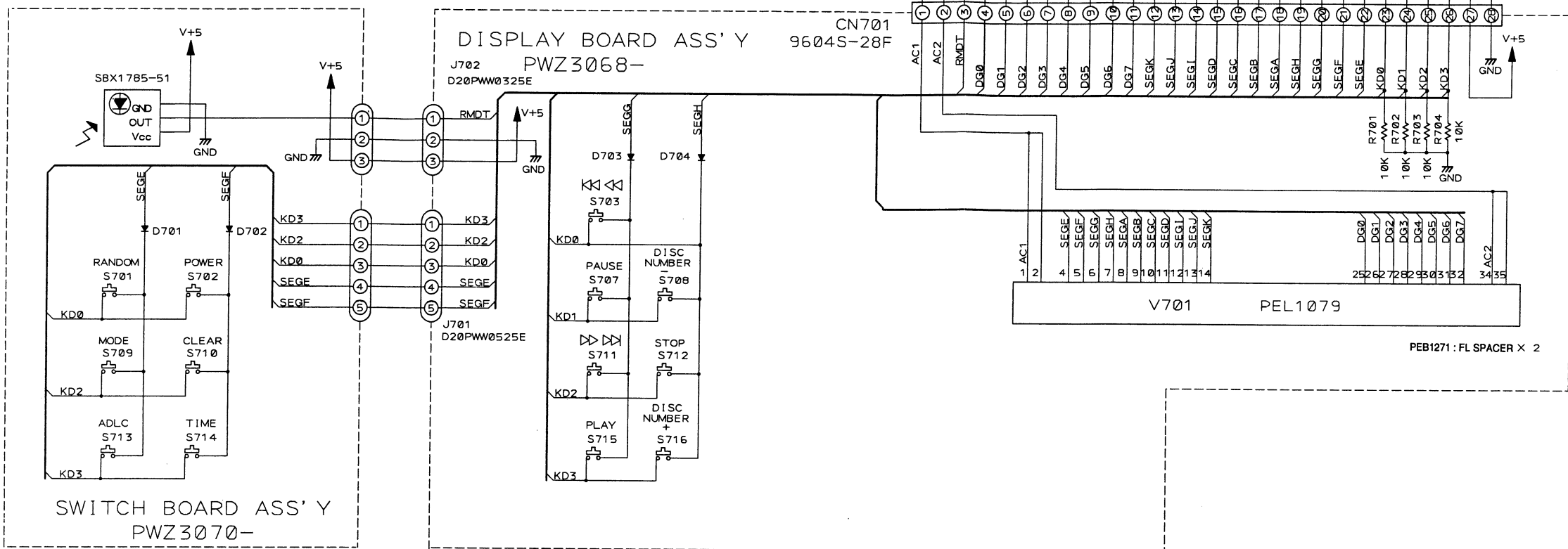
A

B

C

D

NOTE:  
Any diode without part number indicates 1SS254.  
Any tact sw without part number indicates PSG1006.



SCH-3

POWER BOARD ASSY, DISPLAY BOARD ASSY,  
SWITCH BOARD ASSY, ESCUTCHEON BOARD ASSY,  
JOINT BOARD ASSY

POWER BOARD ASSY, DISPLAY BOARD ASSY,  
SWITCH BOARD ASSY, ESCUTCHEON BOARD ASSY,  
JOINT BOARD ASSY

SCH-3

- This diagram is viewed from the mounted parts side.

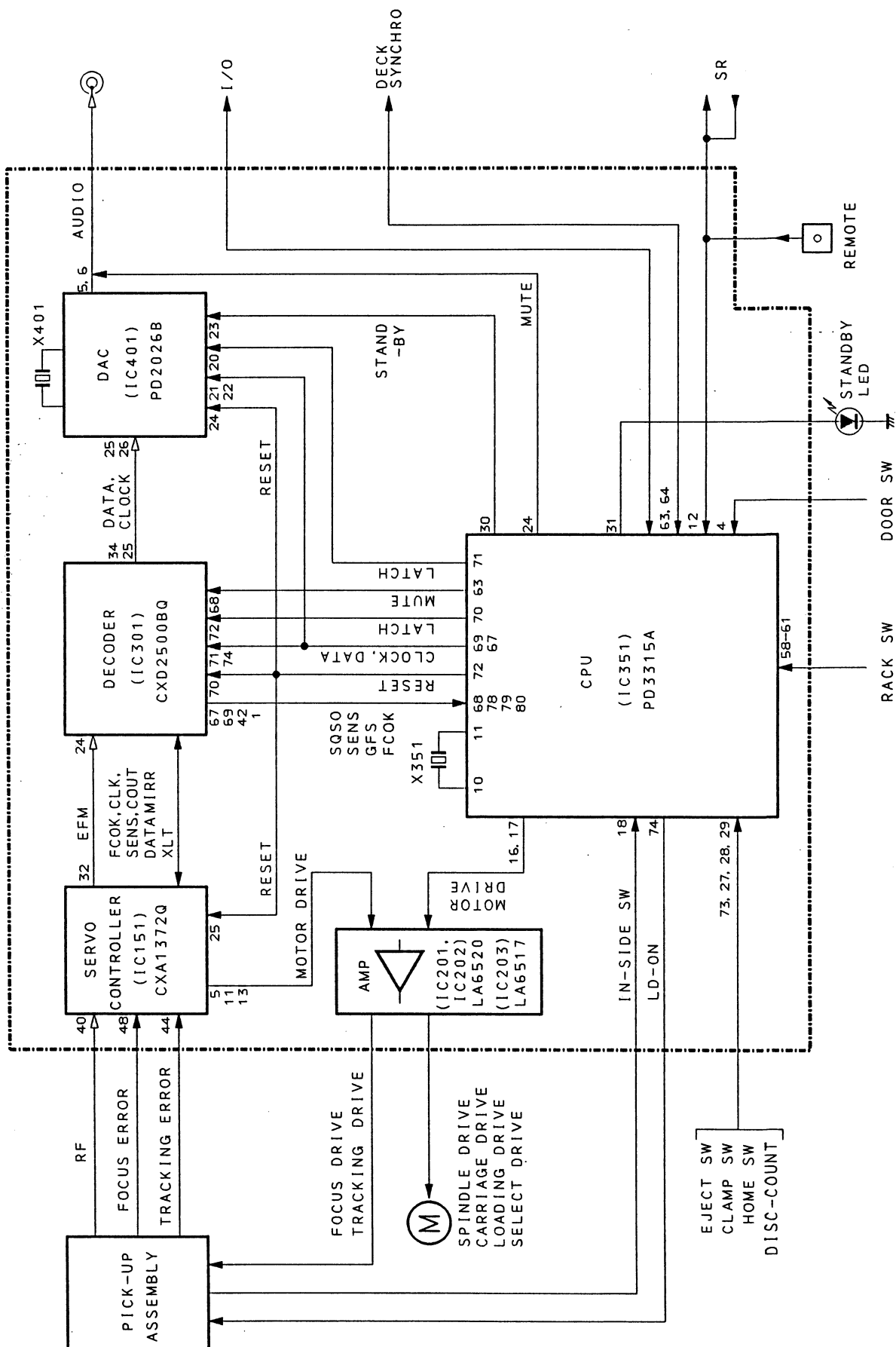
— To MAIN BOARD assy CN351

To MAIN BOARD assy CN11



# 10. BLOCK DIAGRAM

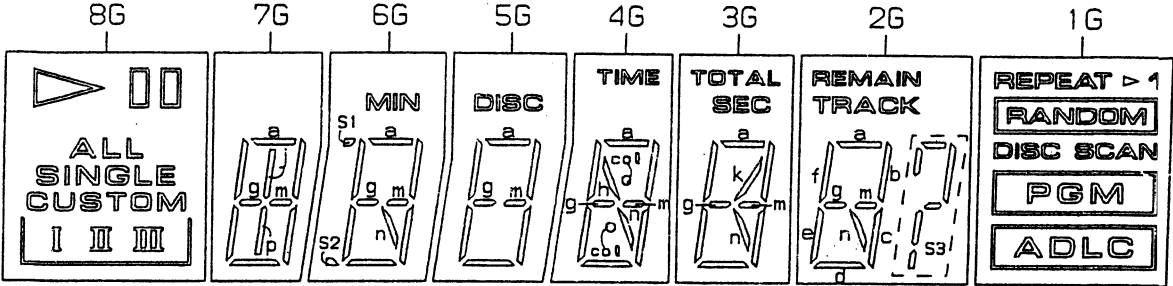
PD-F904



11. FL INFORMATION

■ PEL1079 (V701 : DISPLAY BOARD ASSY)

- FL Tube
- Grid Assignment

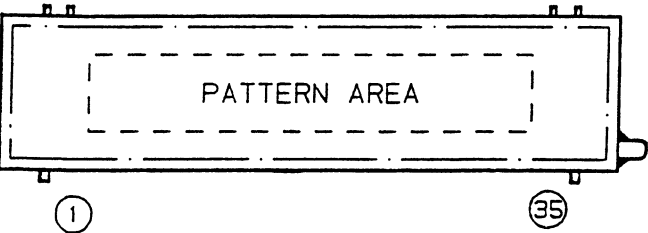


● Pin Connection

PIN NO.	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	2	2	2	2	2	2	2	3	3	3	3	3	3	
CONNECTION	F	F	N	P	P	P	P	P	P	P	P	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	
	1	1	P	5	6	7	8	1	2	3	4	9	0	1	P	P	P	P	P	P	P	P	P	P	P	P	G	8	7	6	5	4	3	2	1	N

NOTE 1) F1, F2 --- Filament  
2) NP ----- No pin  
3) DL ----- Datum Line  
4) 1G~8G --- Grid

● Pin Assignment



● Anode Connection

	8G	7G	6G	5G	4G	3G	2G	1G
P1	ALL	a	a	a	a	a	a	RANDOM
P2	SINGLE	b	b	b	b	b	b	-
P3	I	c	c	c	c	c	c	-
P4		d	d	d	d	d	d	ADLC
P5	III	e	e	e	e	e	e	PGM
P6	CUSTOM	f	f	f	f	f	f	DISC
P7	-	g, m	g, m	g, m	g, m	g	g, m	SCAN
P8	-	-	S1, S2	-	col	m	S3	-
P9	III	j, p	n	-	h, n	k, n	n	-
P10	▷	-	MIN	DISC	-	SEC	TRACK	> 1
P11	00	-	-	-	TIME	TOTAL	REMAIN	REPEAT



## 12. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

### ■ PD3315A (IC351 : MAIN BOARD ASSY)

#### ● System Control Micro-computer

##### ● Pin Function

No.	Symbol	Pin Name	I/O	Description
1   3	P04/AN4   P06/AN6	P1S1   P1S3	I	+1 disc detection input (only models +1 disc installed) (Not used)
4	P07/AN7	CLSE	I	Door close OK SW (L: Close OK)
5	AVss	No use	GND	(Reference voltage for A/D converter): GND
6	TEST	No use	GND	(Test terminal for maker): GND
7	X2	No use	—	(Sub clock oscillator connected terminal): OPEN
8	X1	No use	+5V	(Sub clock oscillator connected terminal): Vcc
9	Vss	Vss	GND	GND
10	OSC1	OSC1	—	Connected to System clock oscillator (8MHz)
11	OSC2	OSC2		
12	RES	RST	I	CPU reset (L: Reset)
13	P10/IRQ0	RDMT	I	Remote control data input
14	P11/IRQ1	SCOR	I	Sub code sinc S0+S1 input
15	P12/IRQ2	DRST	O	Selector output port Right direction (DRST: H, DSLT: L) Left direction (DRST: L, DSLT: H)
16	P13/IRQ3	DSLTL		
17	P14/IRQ4	LIN	O	Loading output port Clump (LIN: L, LOUT: H) Return (LIN: H, LOUT: L)
18	P15/IRQ5/TMOE	LOUT		
19	P16/EVENT	INSD	I	Slider INSIDE SW input (L: INSIDE)
20   22	P33/FS27   P31/FS25	KD3   KD1	I	Key • data input
23	P30/FS24	KD0/TEST	I	Key • data input TEST mode request input (H: TEST, L: Normal mode)
24	P47/FS23	MUTB	O	Muting output (L: MUTE)

No.	Symbol	Pin Name	I/O	Description
25	P46/FS22	IN1	O	+1 disc eject output port Eject (IN1: L, OUT1: H) Load (IN1: H, OUT1: L) (only models +1 disc installed) (Not used)
26	P45/FS21	OUT1		
27	P44/FS20	HOME	I	Disc selector home SW (L: Home)
28	P43/FS19	CLMP	I	Clump SW (L: Clump OK)
29	P42/FS18	EJCT	I	Loading out SW (L: Loading out OK)
30	P41/FS17	OSCE	O	OSCE output (H: when Standby)
31	P40/FS16	CLED	O	LED output for PLAY INDICATOR (LED Blinking: Not home)
32   35	P50/FS15   P53/FS12	SEG E   SEG H	O	Segment output for FL drive
36   39	P54/FS11   P57/FS8	SEG A   SEG D		
40	P17/Vdisp	Vdisp	I	−26V
41   43	P60/FD0/FS7   P62/FD2/FS5	SEG I   SEG K	O	Segment output for FL drive
44   48	P63/FD3/FS4   P67/FD7/FS0	D7   D3	O	Digit output for FL drive
49   51	P70/FD8   P72/FD10	D2   D0		
52	P73/FD11	RLD1	O	LED output for Rack1 (Not used)
53	P74/FD12	RLD2	O	LED output for Rack2 (Not used)
54	P75/FD13	RLD3	O	LED output for Rack3 (Not used)
55	P76/FD14	RLD4	O	LED output for Rack4 (Not used)
56	P77/FD15	LED	O	Output for LED
57	Vcc	Vcc	—	+5V

No.	Symbol	Pin Name	I/O	Description
58	P80	RRK1	I	Rack1 Yes/No SW (L: No) (only models with 100 discs installed)
59	P81	RRK2	I	Rack2 Yes/No SW (L: No) (only models with 100 discs installed)
60	P82	RRK3	I	Rack3 Yes/No SW (L: No) (Rack1 SW for models with 50 discs installed)
61	P83	RRK4	I	Rack4 Yes/No SW (L: No) (Rack2 SW for models with 50 discs installed)
62	P84	MUTE	O	Muting OUTPUT (H: MUTE) (For I/O INTERFACE)
63	P85	SYC3	O	DECK SYNCHRO signal output (For I/O INTERFACE)
64	P86	SYC1	I	DECK SYNCHRO signal input (For I/O INTERFACE)
65	P87	QSEL	O	Signal output for QDATA discrimination (H: During output of Q DATA) (For I/O INTERFACE)
66	P90/PWM	TRCH	O	Data serial output (For I/O INTERFACE)
67	P91/SCK1	CLOCK	O	LSI serial clock output (For I/O INTERFACE)
68	P92/SI1	SQSO	I	Sub code Q data serial input (For I/O INTERFACE)
69	P93/SO1	MDAT	O	LSI control data serial output
70	P94/SCK2	XLAT	O	LSI control data latch pulse
71	P95/SI2/CS	DLAT	O	DAC control data latch pulse
72	P96/SO2	XRST	O	Reset output for each LSI
73	P97/UD	DCNT	I	Disc count pulse input
74	PA0	LDON	O	Laser diode output (L: ON, H: OFF)

No.	Symbol	Pin Name	I/O	Description
75	PA1	B100	I	Switching port for 50/100 discs mount model (H: 50 discs)
76	AVcc	AVcc	+5V	+5V
77	PO0/AN0	LEDS	I	Switching port for CLED (H: Jointly used for standby)
78	PO0/AN1	SENS	I	LSI operating status multi-mode input
79	PO1/AN2	GFS	I	Frame sync lock input (H: OK)
80	PO2/AN3	FCOK	I	Focus OK input (H: OK)

